

R!

Kate Heffron

When she was a junior in high school, Kate Heffron's older brother worked on a golf course grounds crew outside Toledo, Ohio. "It's not a place for a girl to work," he told her.

One week later, her brother joined the Navy and Heffron was working on the golf course grounds crew. "It was more to spite my brother," she says. "I just wanted to prove to him that I could do it."

She must have done all right. The 28-year-old Michigan State University

when her adviser asked her if she wanted to work for a female superintendent.

"It confused me, because I thought, 'Should I be trying to find a female superintendent to do an internship for?'" she says. "I thought, 'Hmm, what does he mean?' I think he was just trying to make me feel comfortable, but that's not what I wanted."

Feeling comfortable has never been Heffron's goal.

"I feel like on the course I have to do even better than the guys. I have more drive to not mess up and to get it right the first time," Heffron says. "I don't ever want anyone to look back and think, 'It's because she's female.' It pushes me so much more to keep going and keep improving."

There have been times when Heffron has wondered if she wasn't hired because she is female. "Knowing the superintendent's personality a little bit, I do wonder if they would have been able to handle having a woman working for them. And people have made comments, you know, there's always going to be that 'if.' If I went to work for a female superintendent, they'd say I got the job because I am female."

But at Blytheheld, "they do a great job of treating me as an equal," Heffron says. "I have been to other places that have treated me like a girl, who put me on flower duty. Here they're good at giving me equal jobs but also know that some heavy lifting might be too much."

Because of her drive, Heffron was invited to attend last year's exclusive Green Start Academy. Fifty assistant superintendents annually from across the nation are handpicked for the two-day seminar based on winning essays they write.

"I was really proud of going to Green Start," says Heffron. "I thought, 'Why not? I'll try for it.' When I got accepted, my boss was very excited for me. It was very neat."

Heffron was the only woman in the group.

"I'm used to it," she says. "You can't
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Tracey Holliday and her border collie on the job. Holliday was among the first superintendents to use border collies to control geese.



from both sides of the desk. "There were times I'd interview someone for a position and they'd say, 'I just can't work for a woman.'" she says. "People wouldn't shake my hand. There were illegal questions, like, 'What if your boyfriend didn't want you to get up on a Sunday morning and come to work?' or 'Do you feel less feminine because you play sports?'"

Being a woman superintendent is "a constant battle of trying to produce the best you can with the thickest skin you can," she says.

Holliday has thrived despite it all. "I achieved my goal," she says. "I really love it here. This is where I want to retire."

graduate has worked as the assistant golf course superintendent at Blytheheld Country Club in Belmont, Mich. for the past four years.

"Growing up, I was that girl who played baseball. I was that tagalong little sister," says Heffron, the third of five children. "I wore a skirt but wanted to hang with the boys."

Heffron pursued a career in golf course management because she wanted a physical job where she could work outside.

As a Crop and Soil Science major at MSU, Heffron remembers hearing that only 1 percent of golf course superintendents were women. So it surprised her

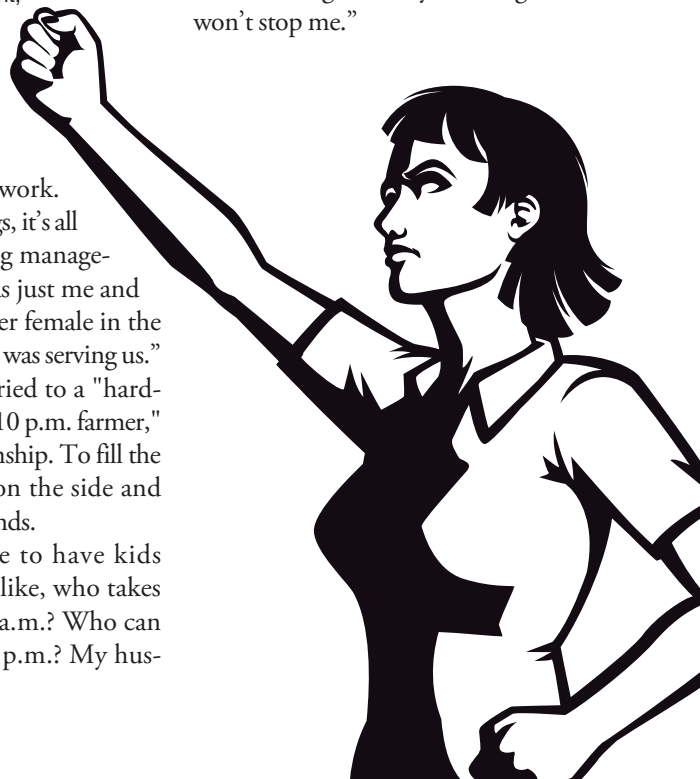


"I can make it happen when I put my mind to something. Being female won't stop me."

— KATE HEFFRON
Assistant Superintendent,
Blytheville CC

band can't carry around a baby when he's feeding cattle."

For now, Heffron is focused on her career. And she's optimistic about being promoted to superintendent one day. "I can make it happen when I put my mind to something," she says. "Being female won't stop me."



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make female friends at work. Even association meetings, it's all guys. We had our spring management meeting and it was just me and 150 guys. The only other female in the room was the server who was serving us."

Heffron, who's married to a "hard-working, come home at 10 p.m. farmer," craves female companionship. To fill the void, she sells jewelry on the side and meets monthly with friends.

Heffron would like to have kids someday, but "it's just like, who takes the kid to daycare at 6 a.m.? Who can pick them up at 6 or 7 p.m.? My hus-

Gillian Bean

As a 16-year-old, Gillian Bean worked on the grounds crew at a club near her hometown, Sunbury, Ohio. One small taste of that and she knew she wanted a career in turf.

"I was sold right away on wanting to do something outside and not sitting at a desk," says Bean, the golf course superintendent at Table Rock Golf Club in Centerburg, Ohio.

Now, the Ohio State grad's career is well established. But Bean's success has been a hard-fought battle, and she's not shy about saying so.

As a woman superintendent, "it's harder to gain the respect of coworkers, management — subordinates who work for you especially," she says matter-of-factly.

"I think females have to work twice as hard as men to earn respect. The guys who work for me on my crews — once they see me go out and dig a hole and see that I know how to do whatever I ask anyone else to do, that's when I get the respect."

Bean, 36, has been superintendent at Table Rock since fall 2009. It was a smooth transition for her. During introductions, she was "this oddity." But she had the support of Table Rock's outgoing superintendent from the start. And after creating good conditions her first season, Bean earned credibility.

Table Rock is supportive of Bean's role of mother to a 4-year-old girl. As a mom, it's often difficult to maintain a superintendent position, given the job's demanding schedule, Bean says.

"My daughter goes to daycare and preschool, but if the daycare calls me at 2 in the afternoon and my daughter has a fever, the course understands that I have to go." Other courses might not be so understanding, she says.

It's been more than two years since Bean was hired at Table Rock. But even now, she can never let up.

"I have to be very quick to show that I'm willing to do the physical labor,"



"I wanted to take care of turf in some way," says Bean.

Bean says. "I feel, as a female, that my staff has to see me do the work. Because — it's not the only way, but it's the quickest way — to earn respect."

When asked about other lady superintendents, Bean, the only female member of the Central Ohio Golf Course Superintendents Association, laments, "Honestly, I don't know any!"

"It does surprise me that I don't know any other women superintendents in the central Ohio area," she says. "But on the other hand, it doesn't surprise me. In my graduating class there were 87 men and two women. You have to have a thick skin, because there are always comments."

And those comments can be heard both on and off the course.

"Let's say I'm in the hallway near the restaurant," Bean marvels. "Without fail some guy will come up to me and assume I'm supposed to be working at the snack bar and say, 'Honey, will you get me a hotdog?' And I don't know how that will change. It happens several times a week."

"The golf community is such a good ol' boys kind of community," she continues. "You could work at a club where women aren't allowed in the clubhouse. That's today. That's not 20 years ago."

As a woman in the golf business, Bean's relentless pursuit of respect propels her success.

So she doesn't sugarcoat her advice to young women considering a career in golf course management. Rather, she says openly: "If it's really what you want to do, it's fantastic. It beats the heck out of being stuck in an office. Just assume you're going to have to prove yourself twice as hard as if you were a man." ■

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■ TIMELY TURF ADVICE



→ It's Time for a Checkup

BY CLARK THROSSELL, PH.D.

While the calendar says February, the weather says March or April. This means it is time to start monitoring the health of your turf. A good place to begin is to record and graph the daily high and low air temperatures. Seeing is believing and the trends that you can see on the graph are much more useful than daily air temperatures from a table or a list. And if you are like me, it is hard to remember the temperatures from two days ago, let alone a week ago.

A graph tells you all you need to know with a quick glance. If you want to make your graph more useful, add the 30-year average high and low air temperatures to the graph. Recording and graphing the soil temperature at a two-inch depth is also helpful information. This graph will provide a great reference when you begin to decide when to implement various management practices.

Overseeded golf courses should be hitting their peak in terms of playing condition and golfer traffic. Right now, temperatures are nearly ideal for overseeded cool season grasses. Light, frequent nitrogen fertilization of all overseeded areas is essential to encourage a moderate amount of leaf growth so the grass can cope with traffic. Adding iron to the nitrogen fertilizer application is a good way to enhance color without stimulating

“Northern superintendents, avoid the temptation to start your management programs until temperatures are consistently above 60° F. If you must be outside, focus your attention on trimming trees and cleaning up the course.”

excess growth. Be sure to keep an eye on cart traffic in congested areas and on par 3 holes. Even though the grass is growing well, concentrated traffic can wear out the overseeded turf and, once worn out, it will be difficult to get that area to recover this season.

Non-overseeded golf courses in the South and in the transition zone are experiencing great weather for golfers, but not great weather for growing warm season grasses. Warm season grasses perform their best when air temperatures are consistently in the range of 80 to 95° F. While there are some green leaves in the canopy, the temperatures are not warm enough to stimulate growth.

Use a gentle approach to all management practices this time of year. And manage traffic carefully. Dormant or semi-dormant warm season grasses can easily be worn out by traffic this time of year, which will slow green-up and recovery later in the spring.

In northern locations, due to a mild winter, cool season grasses may be partially green but they certainly aren't growing. Cool season grasses perform their best when air temperatures are consistently in the range of 60 to 75° F. While the weather is warm for February, it isn't warm enough for cool season grasses to sustain growth. Avoid the temptation to start your management programs until the air temperatures are consistently above 60° F. Manage the traffic carefully, and if you feel the need to be outside, focus your attention on trimming trees and cleaning up the golf course.

If you are concerned about the grass surviving winter, don't hesitate to bring several plugs indoors and place them in a well-lit window and watch what happens. Within a week, the grass should show definite signs of life if it survived the winter.

Record the daily high and low air temperatures all season long. It is a good habit. You can also use the same graph to note various events, such as first mowing of the year, first sign of brown ring patch and first observation of annual bluegrass weevil. This simple graph will soon become your most trusted resource when managing your golf course.

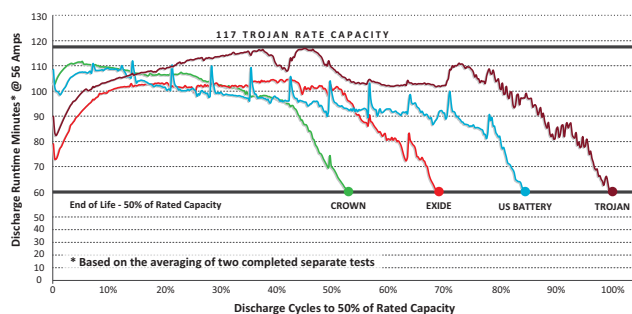
Clark Throssell, Ph.D. is a turfgrass scientist and can be reached at cthrossell@questex.com.



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Golfdom

TURFGRASS TRENDS

NEW BACTERIAL DISEASE

A New Bacterial Disease Problem on Creeping Bentgrass Putting Greens

By Paul Giordano and Joe Vargas, Ph.D.

Summer stress and extreme weather conditions have made managing creeping bentgrass (*Agrostis stolonifera*) in many regions of the country quite challenging. Along with the myriad fungal pathogens golf course superintendents must deal with daily, a pathogenic bacterium has recently been isolated from symptomatic creeping bentgrass putting greens around the country. This newly described turfgrass pathogen has been found to be associated with the accelerated growth (etiolation), yellowing and eventual thinning/necrosis of creeping bentgrass on putting greens during summer heat stress.

The bacterium, identified as *Acidovorax avenae* subsp. *avenae* (Aaa), was initially isolated from a creeping bentgrass putting green on a championship golf course in the transition zone. Numerous greens exhibited recurring symptoms of etiolation and bentgrass decline/thinning over a number of years. The unique symptoms were similar to those exhibited by annual bluegrass (*Poa annua* L.) infected by the bacterial pathogen *Xanthomonas translucens* pv *poae*, but they were more localized in irregularly shaped areas (Figure 1). Researchers were initially baffled by the "mystery syndrome" that seemed to be plaguing various cultivars of creeping bentgrass in putting greens in similar climatic regions. The distinct symptoms and lack of fungal pathogens prompted researchers to investigate other potential causes. Cut ends of etiolating leaves and stems were found to exhibit heavy bacterial streaming; a diagnostic sign of plant bacterial infection (Figure 2). Consistent observation of heavy bacterial streaming from symptomatic tissues led to the isolation of the bacterium for further analysis. The infection potential of the bacterium was tested by inoculating healthy creeping bentgrass. When inoculated plants were incubated at temperatures similar to those in the region where the bacterial disease was first observed (90° F, 75 percent relative humidity), the bacterium was capable of causing severe leaf necrosis and thinning (Figure 3).

After confirmation of pathogenicity (ability to cause disease), molecular analy-
Continued on page 58

Editor's note: While much remains to be learned about the new bacterial disease discussed in this article, we felt it was important that superintendents have the most current information and thinking on the disease to guide their decision making. We look forward to publishing additional information on the bacterial disease as it becomes available.

IN THIS ISSUE

Squeezing Extra Days from Your Fungicide Program by Dew Removal —

Can removing dew or altering mowing frequency on fungicide-treated turf improve dollar spot control?61

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*Yellow, etiolated, irregular-shaped areas on a Penn G-2 creeping bentgrass putting green affected with *A. avenae* subsp. *avenae* (Aaa).*



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 sis identified the bacterium as *Acidovorax avenae* subsp. *avenae*. This particular genera of bacteria contains known plant pathogens that cause a variety of diseases on plants such as corn, sorghum, rice, sugarcane, watermelon and orchids. Throughout the summers of 2010 and 2011, there were many reported cases of the disease around the United States, particularly in the eastern U.S. and in the transition zone. Many of the diagnoses have been met with skepticism due to the lack of a robust diagnostic technique and obsolete methodology.

Bacterial streaming from tissues is a useful diagnostic tool, but in order to confirm that the pathogenic bacterium *Aaa* is indeed present, isolation and identification must be performed. These procedures currently take time and resources that many diagnostic labs do not have. In addition, superintendent impatience has frequently led to unwarranted panic and ineffective treatment action. For these reasons, researchers are currently attempting to develop accurate and reliable

molecular tests that would substantially speed up the diagnostic process. Currently, molecular identification of the bacterium by Michigan State University researchers has confirmed *Aaa* on 12 sites around the United States while other university collaborators have identified the bacterium on numerous additional sites as well.

Preliminary growth chamber and field research has produced some interesting results. However, field inoculations with the bacterium at the MSU Hancock Turfgrass Research Center in 2011 did not produce disease symptoms. One of the major factors contributing to the lack of disease is the cool mid-Michigan summer temperatures, particularly at night. The pathogen has been found to be most aggressive and virulent in growth chamber studies at sustained high temperatures (90°F during the day, 78°F at night.) Additionally, poor air movement and environmental stresses have been a commonality among many of the courses that have confirmed *Aaa* infection.

On-site golf course field research has

been undertaken by university collaborators with variable results. Many of the treatments thought to inhibit the disease or its symptoms are anecdotal, originating with superintendents who have battled the disease season after season. Fungicide combinations, growth regulators, bactericidal antibiotics, biofungicides, and fertilizers have all been proposed as potential treatments for this problem. Lab testing of products against the bacterium *Aaa* has identified some candidates that are capable of directly inhibiting the growth of the pathogen. The antibiotic oxytetracycline, when applied prior to inoculation to plants at 200 parts per million, did suppress symptom development (compared to the untreated control) on plants inoculated with *Aaa* and incubated for 14 days in the growth chamber (Figure 4.)

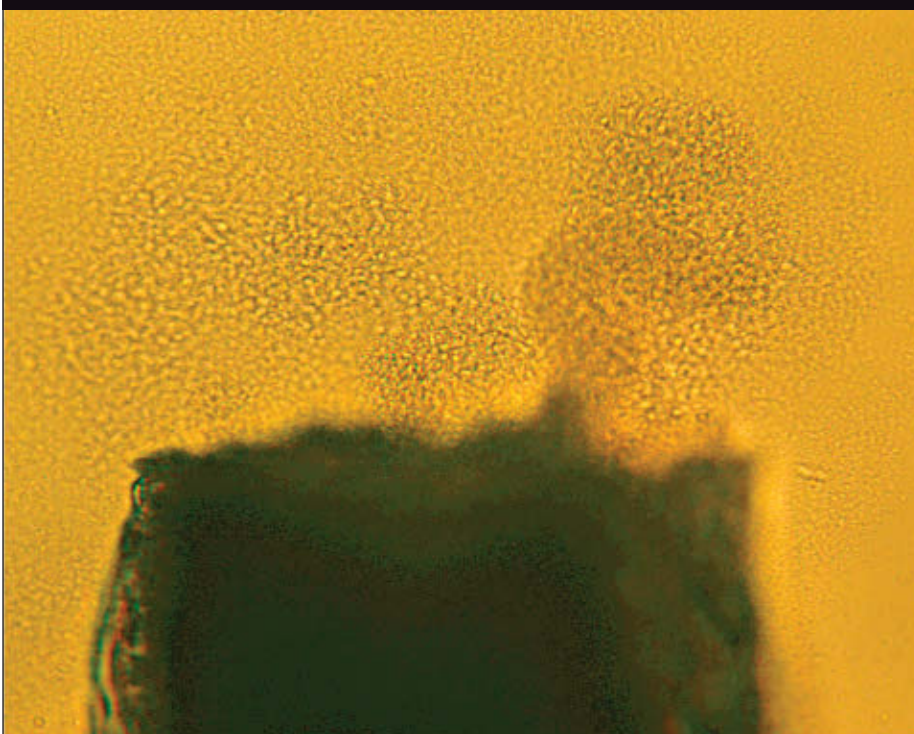
While this result is promising, oxytetracycline is not currently labeled for this use on turfgrass. We also do not know if there will be injury to the turf from applications made in the field during hot weather periods. Further field research must confirm the

efficacy of oxytetracycline and other products before recommendations can be made to golf course personnel dealing with this problem. Growth chamber research is only the first step in evaluating products that have the potential to control a natural disease outbreak on the golf course. There are currently no proven chemical control options for this disease in the field.

While *Aaa* was initially isolated from Penn G-2 creeping bentgrass, growth chamber inoculations, as well as isolations from golf course samples, have shown a variety of *Agrostis stolonifera* cultivars to be susceptible to *Aaa* infection. These cultivars include, but are not limited to: Penn A-4, Penn A-1, L-93, Tyee, Declaration, Bengal, 007, and Penncross. Our initial research has indicated some minor variations in susceptibility in growth chamber inoculations; however, all cultivars tested thus far have been susceptible to infection by *Aaa*, to some extent. It is likely that the bacterium is ubiquitous in many turfgrass environments, and only

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FIGURE 2



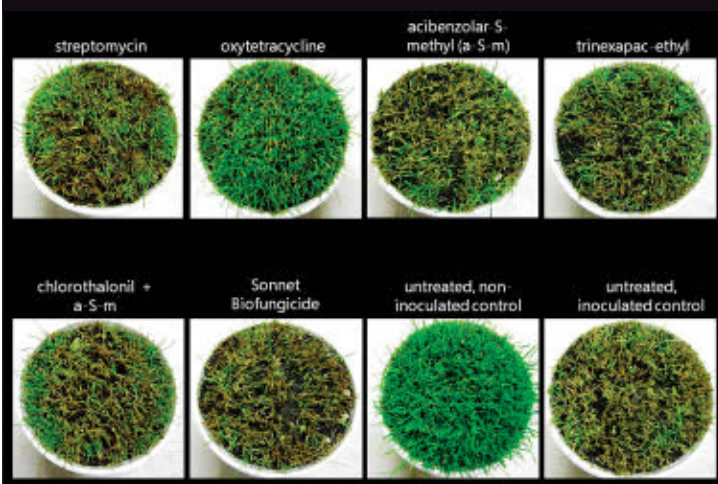
*Cells of the bacterium *Aaa* streaming out of the cut end of an infected creeping bentgrass plant.*

FIGURE 3



Inoculated (left) vs. non-inoculated (right) Penn A-4 creeping bentgrass cups incubated for 7 days at 32 C, after being cut with scissors dipped in a suspension of Aaa.

FIGURE 4



Creeping bentgrass pots pre-treated with various chemicals and challenged with Aaa. Note the suppression of symptoms with the antibiotic oxytetracycline, resembling the non-inoculated control.

Continued from page 59 becomes a problematic plant invader under certain environmental conditions. Researchers are working to identify molecular techniques that will enable quantification of Aaa in environmental samples, so that infected areas can be compared with uninfected areas in order to get a relative indication of bacterial population levels among sites, cultivars, treatments, etc. This type of technique should be useful in developing disease thresholds, making risk assessments, comparing cultivar susceptibility, and determining treatment efficacy.

Most bacterial diseases require a predisposition of the plant in order for infection to take place. Highly maintained turfgrasses such as the newer varieties of creeping bentgrass provide the perfect conditions for would-be bacterial pathogens in the surrounding environ-

ment. Unlike fungi, bacteria enter the plant passively, such as through cut ends of leaves from mowing, wounds made during sand top dressing, or natural openings. Frequent mowing, aggressive cultivation, traffic and increasingly stressful management practices (i.e., low mowing heights), likely all serve to increase the severity of the disease. In extended periods of high heat and humidity, creeping bentgrass putting greens already under stress from these demanding maintenance practices seem to be more vulnerable to this bacterial invasion.

At this time, it is not thought that the bacterium can be effectively transported from course-to-course via shoes or machinery. Therefore, no recommendations are being made with regard to quarantines. Some current recommendations for golf course superintendents battling this problem are:

1. Alleviate stress during summer months.
2. Increase air movement.
3. Raise mowing height during stressful periods.
4. Avoid aggressive cultivation practices such as aeration and topdressing during peak outbreak times.
5. Avoid morning mowing, if possible, in order to reduce the further spread of bacteria in morning dew and guttation water.

Our knowledge regarding this pathogen and the associated disease symptoms is still limited, and much research is required to better understand this controversial problem. This will require effective collaboration among university researchers, industry associations and golf course superintendents in order to find the best management practices to solve the problem. Until further research is conducted into disease management in the field, it is difficult to make recommendations regarding product usage and symptom suppression. Stay in contact with your local university for current research findings and management information on this emerging disease.

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