

TURFGRASS TRENDS

Section II • Volume 11, Issue 10 • October 2002

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DISEASE MANAGEMENT

Anthracnose Update

Cultural practices affect spread of disease in Northwest

Combination of fungicides stems tide in mid-Atlantic

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By David Spak

Anthrachnose basal rot (ABR) is a serious and common disease of annual bluegrass and creeping bentgrass putting greens. Incidence and the severity of ABR outbreaks greatly increased throughout the Midwest, Northeast and the Pacific Northwest in the late 1980s and 1990s.

This highly destructive disease rapidly became one of the most difficult and challenging management issues for many superintendents.

Anthracnose basal rot is caused by the pathogen *Colletotrichum graminicola*. Once established, ABR can quickly destroy the stems, crowns and roots of susceptible turf, compromising plant health, playability and appearance. This disease is highly destructive, difficult to manage and quite variable in symptom development and expression. Anthracnose basal rot development has been associated with nutrient deficiencies, low mowing heights, compaction, poor drainage and wounding caused by aerification and topdressing.

ABR was first confirmed in Washington in 1995. Several years prior to this, researchers noted that following aerification and topdressing, some *Poa* greens would wilt and collapse, but a disease or causal organism was not identified. This wilting typically followed a hot, dry period when the superintendent had been

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The increasing demand for tournament-level course conditions on a daily basis puts a strain not only on superintendents, but also the greens they're maintaining. The ill effects of the intensive manicuring needed to produce such conditions are no more visible than in the mid-Atlantic region, where basal rot anthracnose, once only a summer stress phenomenon, has become a nearly year-round, annual problem on courses.

Basal rot and foliar blight are the two dominant biotypes of anthracnose, a fungal disease first reported on greens in the United Kingdom in the 1950s. Principally a disease of *Poa annua* and creeping bentgrass greens, basal rot is the more prolific and widespread of the two and has begun appearing in March through November on *Poa* greens in the mid-Atlantic.

Early basal-rot infections have done the most damage on older mid-Atlantic courses. Henry Wetzel, superintendent at St. David's GC in Wayne, Pa., has encountered basal-rot anthracnose problems on his 76-year-old greens since the mid-1980s.

"These are old *Poa* greens built in 1926," Wetzel says. "Back in 1985, we had our first problem with basal rot, and we've been battling it ever since."

Difficult diagnosis

Basal rot infections in *Poa annua* first appear during cooler, moist weather conditions,

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which are typical in late spring or early summer. First signs of infection include irregular patches of orange-to-yellowing turf (also known as "winter anthracnose") in March.

Later, infected plants collapse, which is often mistaken for bacterial wilt. Hair-like black, fruiting bodies at the base of plants are a tell-tale sign of anthracnose outbreaks, but by the time these hairs are visible with basal rot infection, it's already too late to respond with fungicide applications. Strains of the disease tend to attack the dominant grass type in a green while leaving lesser types untouched.

While there is no true fix on the exact conditions that have prompted the early appearance of basal rot, one can look at a mix of environmental and man-made factors as possible causes. Unusual weather patterns in the mid-Atlantic (from record highs one summer to unseasonable lows the next) contribute. Combine this with management practices meant to increase greens speeds, including low mowing heights, decreased nitrogen and topdressing, and the turf is weakened to a point where it is much more susceptible to disease. Poor drainage practices and reduced sunlight have also been shown to aggravate the spread of the disease.

"The methods superintendents use to maintain their greens, including increased mowing frequency, double- and triple-cutting and verticutting, have taken away their turf's ability to fight infection," says Dr. Bruce Clarke, director of the Center for Turfgrass Science at Rutgers University in New Jersey. Clarke is currently overseeing a series of fungicide trials for preventive control of basal-rot anthracnose on *Poa annua*/bentgrass greens.

"In the mid-Atlantic, the tremendous heat stress on turf recently only encouraged the development of the disease," he continues.

One thing is certain about basal rot infections: Without early detection or prevention, plants will ultimately die.

Cultural control

Most superintendents and researchers agree that extreme manicuring practices strain turf. Since this strain is self-inflicted, superintendents can adopt practices to minimize the damage caused by basal rot.

Recommended practices include raising

mowing heights, decreasing mowing frequency and using "floating" walk-behind mowers. Other recommendations for turf care while the disease is active include avoiding topdressing, vertical cutting, rolling and other injurious practices, as well as diverting traffic off greens.

When Wetzel encountered a particularly bad outbreak at St. David's last year, he decided to alter his manicuring practices.

"We had been mowing our greens at one-eighth of an inch," he says. "Last year's basal rot was particularly bad, so we finally raised mower heights to five-thirtyseconds of an inch, and this seemed to clear up the problem."

While these cultural practices provided Wetzel with a short-term solution for his basal-rot problem, the issue of players' demands for faster greens still remains.

"We've continued to mow at this height, but I don't know how long we can maintain that with the pressure we're getting from our players. Once I lower the mowing heights, I know the disease will be back."

In a basal-rot trial conducted by Clarke, measures to increase plant health have also resulted in noticeable disease improvements.

"We applied an additional one-eighth of a pound of nitrogen in the form of urea every two weeks," Clarke says. "These plots were visually less diseased."

Fungicide management

When superintendents do not have the option to commit fully to a basal-rot control program using cultural practices, fungicides become a necessity to prevent the disease. In these cases, applying both contact and penetrant fungicides, often in combination, has shown some success.

Because the timing and location of basal-rot infections are often unique to a specific course, superintendents should draw on past experiences, such as timing and environmental conditions present at the time of past infections.

Applications should be made at least two to four weeks prior to anticipated disease activity, and at 14-day intervals for maximum disease prevention. Making early applications is important, as basal rot is often difficult to detect in its earlier stages. Basal rot has proven to be a recurring problem. Rotating fungicides and applying multiple fungicide chemistries will reduce the risk of resistance.



QUICK TIP

One of the most frequently asked questions about Roundup Ready Creeping Bentgrass is, "How do I eliminate Roundup Ready Creeping Bentgrass if it ends up in my roughs?" Fortunately, the answer is simple: Use one of the other nonselective herbicides on the market today.

Clarke's ongoing trials began in May 2002. For these trials, he identified the four most widely used fungicide chemistries in use for anthracnose control — benzimidazoles, benzonitriles, demethylation inhibitors (DMIs) and strobilurins — applying a range of fungicide treatments that included them all. Clarke employed a spray interval of 14 days at varying rates.

"The benzonitriles and DMIs showed effective control, but the results from DMIs were variable," Clarke says. "In contrast, the strobilurins and benzimidazoles didn't provide effective control."

Best of both worlds

Since basal rot thrives on weakened turf, maintaining plant health is a necessity when balancing disease prevention with providing top-flight green speeds. Chipco Signature fungicide has shown an ability to improve turf health under stress conditions, and a new label including anthracnose-control recommendations allows for even greater application flexibility.

Whitford CC in Exton, Pa., like many older courses in the mid-Atlantic, had regularly experienced basal-rot problems. Most of the greens at Whitford are comprised predominantly of *Poa*, with percentages ranging from 30 percent to 70 percent. Situated in a valley, these greens are push-up type with little drainage, adding to the basal-rot problem that has appeared as early as February. Kris Givens, superintendent at Whitford CC, tried a number of methods to solve the disease problem.

"We tried organic products, along with ammonium sulfate every two weeks, for basal-rot control," Givens says. "We also tried fungicide treatments. Two greens were also reconstructed to USGA specifications, while drains were installed on four of our worst greens to alleviate standing water."

In field trials conducted last summer at Whitford CC, treatments of Chipco Signature+Daconil were applied, along with a range of other fungicides. The Signature+Daconil applications provided the highest levels of control and turf quality, preventing the appearance of basal rot through July.

"Basal-rot plot testing was conducted in April 2001 on our 13th green," Givens says. "We noticed no basal-rot activity on the plots with Chipco Signature+Daconil. In contrast,



Field trials at Whitford CC in Exton, Pa., show a combination of fungicides work best against anthracnose basal rot in the mid-Atlantic region.

anthracnose was severe outside of the Signature + Daconil plots."

Clarke applied Chipco Signature (4 ounces per 1,000 square feet) both alone and in combination with a number of products. "The Signature applications worked well through mid-August, but then experienced a drop-off," Clarke says. "However, a combination with Daconil Ultrex (3.2 ounces per 1,000 square feet) achieved higher control levels. While both the Signature and Daconil treatments provided strong anthracnose prevention, the two worked even better in combination."

Overall improvement

"I've used Chipco Signature in trials for a number of years, and each time I see enhanced density and turf quality," Clarke says. "I believe what we're seeing is a combination of both fungicidal activity and an overall improvement in plant health. Anthracnose is a plant health disease, so applying Signature in combination with your anthracnose treatment will certainly increase your control."

Whether using fungicides or cultural practices for basal-rot prevention, maintaining healthy greens is certainly everyone's top priority. It is up to superintendents to choose the best way to maintain that plant health with the resources they have available.

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