Impact of NE-1025 BMPs on Anthracnose Management: An analysis of superintendent experiences

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August 2008

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Detroit's Donald Ross gem, Oakland Filts, welcomes the PGA Championship

Plagues of Pol

Special research section reports on anthracnose, annual bluegrass weevil

Best management practices for anthracnose on annual bluegrass turf

Although our understanding of anthracnose disease on *Poa annua* greens is incomplete, several cultural and management practices can reduce its occurrence and its severity.

Anthracnose (caused by *Colleiorrichum cereale*) is a destructive fungal disease of weakened turf that occurs throughout the U.S., Canada and Western Europe (15) and is particularly severe on annual bluegrass (*Poa annua*). The frequency and severity of anthracnose epiphytotics on golf course greens has increased over the past decade (13,14) and is thought to be associated with some of the management practices used by superintendents to improve playability and hall-roll distance. Combinations of management factors may be enhancing the severity of this disease.

Scientists within the NE-1025 multistate turf research project are studying the biology, ecology and management of anthracnose of annual bluegrass turf on golf courses. They are examining the biology of the pathogen, assessing fungicidal control and fungicide resistance development, evaluating the effect of cultural practices on anthracnose severity and developing annual bluegrass and bentgrass selections for resistance to this disease. Completed and ongoing field trials within this five-year project (2005-2010) have evaluated registered and experimental fungicides, fungicide programs and annual bluegrass management practices, including nitrogen fertility, chemical growth regulation, mowing, rolling, topdressing, verticutting and irrigation as well as the potential interaction among practices. Ultimately, results from these experiments will be used to devise a comprehensive set of best management practices for the control of anthracnose disease on golf courses.

Host susceptibility

Anthracnose can be found on cool- and warmseason turf in roughs, fairways and tees, but often the disease is most destructive on annual bluegrass maintained at a putting green height of cut. Outbreaks are also increasingly common on creeping bentgrass (Agronis scolonifera) and may develop on other cool-season turf species including ryegrasses (Lolium species), fescues (Festuca species), Kentucky bluegrass (Poa pratensis) and velvet bentgrass (A. canina).

Although the disease is often most severe during warm weather, outbreaks may occur throughout the year, causing either a foliar blight or a basal rot of leaf sheaths, crowns and stolons (15).

Anthracnose is often present on turf mowed at a higher height without producing severe damage, which suggests that plant health (vigor and stress) is a major factor that determines disease severity. The disease can cause extensive injury on turf maintained at low fertility, very low mowing heights or turf grown under suboptimal conditions (drought stress, excess shade, high humidity).

The greater susceptibility of annual bluegrass to anthracnose is probably related to a number of factors including the weak perennial nature of this grass species. Annual bluegrass is well known for its prolific seedhead (flowering) expression that occurs predominantly in the spring (April through early June). Seedhead development requires considerable metabolic energy, which reallocates photosynthate away from roots and shoots toward seedheads just before the most stressful time of



James Murphy, Ph.D. Frank Wong, Ph.D. Lane Tredway, Ph.D. Jo Anne Crouch, Ph.D. John Inguagiato Bruce Clarke, Ph.D. Tom Hsiang, Ph.D. Frank Rossi, Ph.D.

Purpose:

• Assess superintendents' understanding of and experience with NE-1025 BMPs

 Document the impact BMPs have had on superintendents' efforts to minimize anthracnose



Survey Methodology

- Developed by NE-1025 members
 - "Robust" = 71 Questions
 - Course / respondent profile
 - Location
 - Superintendent?
 - Anthracnose incidence
 - Experience with BMPs
 - Cultural practices
 - Chemical control strategies
 - Financial implications
 - Effectiveness
- Online survey hosted by GCSAA
- 8 March to 8 April 2011
- Distributed to superintendents



From:	CAGCS [cagcs@sbcglobal.net]		
To:	Rackliffe, Steven; Inguagiato, John		
Cc			
Subject:	Final Notice—University scientists need		

your help!

Dear CAGCS Superintendents:

Final Notice—University scientists need your help to evaluate anthracnose research efforts

Please respond by THURSDAY APRIL 7

Over the past few weeks, university researchers have been asking superintendents to participate in an online survey to help determine the effectiveness of current management recommendations for anthracnose,

Sent: Mon 4/4/2011 11:36



Attention Golf Course Superintendents!

University scientists need your help to evaluate anthracnose by the Green Section staff



ns on turfgrass (left) and microscopic view of the setue of the fungus (right). Images provided by Dr. Eric B. Nelson, Cornell University.

Anthracnose continues to plague golf course putting greens. University researchers are asking golf course superintendents to participate in an online survey to help them better understand the challenges presented by this chronic and widespread disease. Your input will provide critical feedback to determine the effectiveness of current management recommendations to reduce anthracnose severity and to develop new research studies to improve disease control. The survey information gathered will be



Superintendents Encouraged to take **Anthracnose Survey!**

TURF DISEASES ON NO COMMENTS

Home

TAKE THE SURVEY

As you may remember a relatively large group of researchers from various universities across the country have been actively working on research related to the management of anthracnose basal rot of annual bluegrass The project started about 5 years ago and was kicked off by gathering information from about 400 superintendents and turf professionals to figure out what was happening in the field and what was lacking the way of research-based recommendations. Well we have come to the end of the first phase of the project and are hoping to 1) gather





University Scientists Need Your Help To Evaluate Anthracnose Research Efforts

Submitted by CAGCS on Wed, 03/16/2011 - 12:41.

University researchers from New England and across the country are asking golf course superintendents to participate in an online survey to help them better understand the challenges you face in managing thrachose on putting green turf Over the last six years this

Survey Responses

- Only superintendents responses evaluated
- Included only respondents with anthracnose
- 988 Superintendents participated
 48 states in the US, and Canada
- 631 Superintendents reported having anthracnose
- Data analyzed using descriptive statistics



Anthracnose Incidence 66% Superintendents had anthracnose (n=959)



Cultural Management

Putting Green Management: Brief Historical Perspective

 Increased demand for competitive putting surfaces

Reduced annual nitrogen fertility:
5 to 7 lbs N 1000 ft⁻²: 1980's
1 to 3 lbs N 1000 ft⁻²: 2000's

Reduced mowing heights:

- ¼ inch: 1950-70's
- ⁵/₃₂ inch: 1980's
- 1/8 1/10 inch: 1990's to today



Cultural Management Nitrogen Fertility

Have you increased light & frequent nitrogen applications?



Cultural Management Nitrogen Fertility

Have you increased light & frequent nitrogen applications?

How effective was this practice?





Cultural Management Mowing

Have you increased mowing height?





Cultural Management Mowing

Have you increased mowing height?

How effective was this practice?





Cultural Management Sand Topdressing Have you increased sand topdressing

during the season?





Cultural Management Sand Topdressing

Have you increased sand topdressing during the season?

How effective was this practice?





Cultural Management Irrigation

Have you modified irrigation practices to reduce wilt stress?





Cultural Management Irrigation

Have you modified irrigation practices to reduce wilt stress? How effective was this practice?





Chemical Control Strategies

August 2011 Storrs, CT



Chemical Control Strategies Have you identified effective fungicides with different MoA and rotated or tankmixed them?





Chemical Control Strategies Have you identified effective fungicides with different MoA and rotated or tankmixed them?

How effective was this practice?



Impacts of NE-1025 BMPs on Anthracnose Management



How confident are you in managing anthracnose after learning of the BMPs?

34% Somewhat Confident

7% 16% Very Confident 59%

Still Not Confident

43% Confident



Has adopting any BMPs affected turf loss from anthracnose?

6%

5%

Completely eliminated turf loss due to anthracnsoe

Reduced turf loss to tolerable levels

Turf loss remains problematic and unacceptable

BMPs have not changed losses from anthrancnose

Have not implemented any of the project's BMPs 80% of superintendents reported saving: \$1,000 to \$20,000

1<u>3</u>%

73%

60%

16%

Impacts of BMPs Fungicide Use

How has fungicide use for anthracnose changed over the last 5 years?

Fungicide Rate Fungicide Interval





Impacts of BMPs Budget How has your budget changed over the last 5 years to manage anthracnose?



Conclusions

- Superintendents are familiar with NE-1025 BMPs
 - Majority of superintendents have implemented practices
- Anthracnose is still a widespread problem
 - BMPs have increased superintendents' confidence in managing this disease
- Changes in cultural and chemical management has reduced turf loss
- BMPs offer a sustainable management approach
 - Extended fungicide application intervals
 - Potentially reducing amount of fungicide applied for control of this disease
 - In many cases, increased costs were offset by savings from recovery practices



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- Teresa Carson, GCSAA
- Greg Stacey, GCSAA
- Local Superintendent Chapters
- Golf Course Superintendents





Rutgers Plant Diagnostic Laboratory Golf Turf Samples 2001-2011



Results from this research were summarized to produce best management practices (BMPs) for anthracnose and ABW control. The first comprehensive versions were published in GCM in August 2008. These documents reviewed much of the research conducted by members of NE-1025 prior to 2008 and provided superintendents with a foundation to build an integrated management plan for anthracnose and ABW. Additionally, NE-1025 members actively disseminated BMPs through extension bulletins, factsheets, field days, webinars, conference presentations, and special symposia at regional and national conferences. The goal of these outreach efforts was to improve superintendents' knowledge of anthracnose and to encourage adoption of sustainable cultural and chemical management practices that provide effective anthracnose control. At the conclusion of the 6-year NE-1025 project, members needed to document the impact of their research and outreach efforts on the management of this important disease. To accomplish this, an online survey of golf course superintendents was conducted in 2011. The objectives of this survey were: 1) to assess superintendents' understanding of and experience with the BMPs developed by the NE-1025 project and 2) to document the impact these BMPs have had on superintendents' efforts to minimize anthracnose in golf course putting green turf. This article summarizes the results of this survey.



USDA NE-1025 Multistate Regional Project Anthracnose Survey

The purpose of this survey is to assess your understanding of and experience with the effectiveness of best management practices developed to minimize anthracnose disease in golf course putting green turf. Your participation in this survey is voluntary. <u>Personal information will not be shared with anyone other than researchers on this project and all data will appear only in a summary format along with information submitted by other superintendents.</u>

Thank you for taking time to complete our survey.

By participating in this survey, you are giving your expressed consent to utilize this information for university research purposes only.

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