



TURF
REPORTS

DISEASE CONTROL **PRESENTED BY BAYER**





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The Environmental Science business of Bayer is proud to sponsor the following report on turf disease management practices. This year, depending on your location, Mother Nature delivered hurricanes, flooding, temperature extremes and drought. Add in the “Covid effect” in terms of increased golf rounds and it was the perfect recipe for stressed turf and disease outbreaks.

Without a doubt, anthracnose was rampant this year on annual bluegrass greens. While disease symptoms tend to be expressed in the heat of the summer, control strategies should be implemented starting in the spring. Cultural management practices include maintaining mowing heights) 0.125 inch, spoon feeding nitrogen weekly, topdressing frequently with light sand, and avoiding moisture stress. Fungicide applications should be initiated in the spring when 2” soil temperatures taken daily at 11 a.m. average 65-68°F for five consecutive days. Consider applying a broad-spectrum fungicide like a DMI to not only control anthracnose, but also other diseases like fairy ring, brown ring patch, dollar spot and summer patch. This application timing is also effective for *Pythium* root rot, which is one of those diseases becoming more and more prevalent across the country. Including a *Pythium* fungicide in these tank-mixes will help minimize damage later in the year.

Shifting to fairways, the summer brought about the typical culprits in dollar spot, brown patch, and gray leaf spot. All three diseases are incited under similar environmental conditions of warm, humid weather with periods of extended leaf wetness. Cultural strategies include mowing or rolling to remove dew, maintaining nitrogen levels to allow for turf growth and recovery, and avoiding soil moisture extremes. Preventative fungicide programs are always best and should be initiated in spring or early summer to keep inoculum levels below damaging thresholds for brown patch and dollar spot. Gray leaf spot can be devastating in late summer, so preventative applications should start in late June or July.

To help battle these problematic diseases and more, this summer, Bayer added a new solution to its strong portfolio of fungicides with the launch of Densicor®. Featuring the active ingredient prothioconazole, Densicor is an exciting DMI fungicide that was built to tackle the toughest diseases across the golf course while providing remarkable turf safety. It offers both preventative and curative control for up to 28 days of dollar spot, brown patch, anthracnose, gray leaf spot and Microdochium patch/snow mold and other challenging diseases. In total, Densicor controls 13 different cool- and warm-season diseases. And it features all the qualities you need in a great fairway fungicide including a single, ultra-low use rate and convenient packaging while also delivering powerful efficacy for greens applications. You can learn more about this new game-changing technology at es.bayer.us/densicor.

Again, Bayer is honored to support the following turf disease management report based on a survey administered by *Golf Course Industry*. If you have questions regarding disease control on your course, our Green Solutions Team of turfgrass technical specialists are just a phone call, email, or text message away, as is our nationwide team of area sales managers. Reach out if we can be of assistance!

Zac Reicher, Ph.D.

Rob Golembiewski, Ph.D.



*ALWAYS READ AND FOLLOW LABEL INSTRUCTIONS

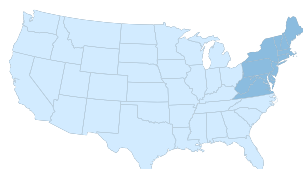
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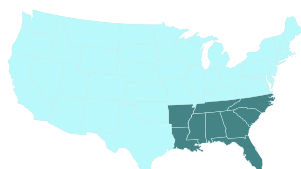
Examining disease concerns, fungicide usage and budgets

Controlling disease on playing surfaces represents a major part of an agronomic program — and we have the numbers to prove it. *Golf Course Industry* partnered with Bayer to accumulate data on various aspects of disease control programs. What diseases keep your peers on their best scouting and control behavior? How much are golf facilities spending on fungicides? How are greens treated compared to fairways? Answers abound on the following pages. To execute this report, *Golf Course Industry* collaborated with Signet Research, a New Jersey-based independent research firm, on a 20-question survey sent to 4,317 print and/or digital subscribers holding the title of superintendent, director of agronomy or assistant superintendent. The survey was distributed via email on four occasions from Sept. 9 through Sept. 21. Results are based on 250 returns and the confidence level is 95% with a sampling tolerance of approximately +/- 6.2%. The survey is the third of three “Turf Reports” studies published in 2021. Bayer also sponsored the ABW and white grubs control report in the September issue.

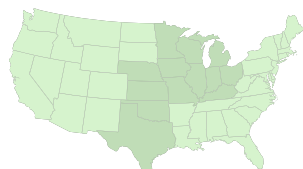
Where is your course located?



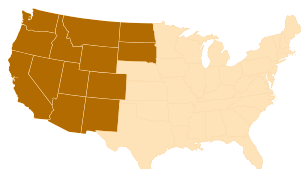
NORTHEAST
21%



SOUTHEAST
19%

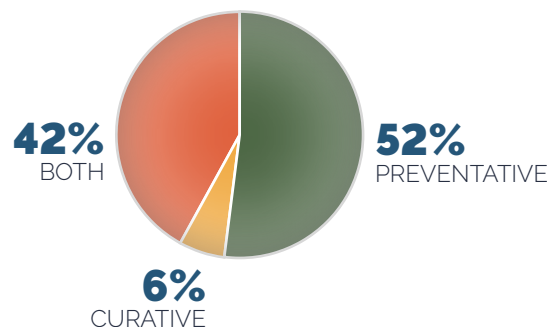


CENTRAL
37%

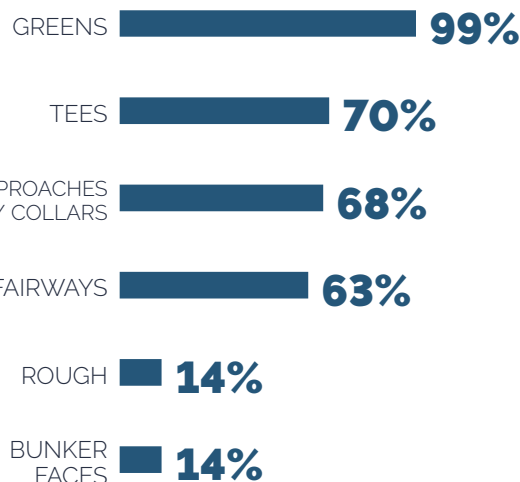


WEST
23%

Description of your fungicide program



Areas of course treated for disease with fungicides



Annual fungicide budget

LESS THAN \$5,000	10%
\$5,000 TO \$9,999	6%
\$10,000 TO \$14,999	7%
\$15,000 TO \$29,999	14%
\$30,000 TO \$49,999	14%
\$50,000 TO \$99,999	27%
\$100,000 TO \$249,999	18%
\$250,000 TO \$499,999	4%



STORIES BEHIND THE SURVEY

Superintendents discuss how they approach, develop and tweak their disease control programs.

BY JOHN TORSIELLO

Golf Course Industry contacted several superintendents around the country to get their take on their personal disease control programs. Here's what they had to report.

Delmar Israel, the director of golf course operations at Stone Canyon Club in Oro Valley, Arizona, considers multiple factors when developing a disease control program. Past history, weather, seasonal turf type, chemical applications and cultural practices are all major influences in his strategy.

"As an annually overseeded golf course, we grow both warm- and cool-season grasses and both at the same

time much of the year," Israel says. "On our greens we utilize a number of different fungicide products during overseed grow-in to combat damping off, *Pythium* blight, *Pythium* root rot, take-all root rot and rapid blight. All of the irrigation utilized during overseed grow-in to ensure

germination produces an environment for disease pressure. Utilizing different fungicide products immediately following germination is key for a successful overseed as well as protecting our base TifEagle turf."

Throughout the winter and early spring, Israel applies products "more for our TifEagle base than our overseed turf," with *Pythium* root rot and take-all root rot the two main diseases he applies preventative fungicides to control.

"Proper water management is key as well to limiting disease pressure," he adds. "We utilize moisture meters and hand watering to ensure greens have adequate but not excess moisture. We also perform bi-weekly sand topdressing applications as well as monthly solid tine aerifications to promote healthy turf and gas exchange."

In the spring, Israel "shifts gears and wants the TifEagle turf to become dominant over the overseed *Poa trivialis* variety." As watering needs increase due to higher temperatures, rapid blight becomes an issue

How many members of your team are involved in creating and executing your spray program?

1	43%
2	37%
3	15%
4	3%
5 OR MORE	2%

Concern over fungicide resistance

1 – NOT ALL CONCERNED	19%
2	13%
3	29%
4	25%
5 – VERY CONCERNED	14%



due to a reclaimed water source that is used for irrigation being high in salts. He utilizes “flushing” as a way of stripping salts and bicarbonates from the soil profile.

“Our sand topdressing applications also change to weekly as we lower mowing heights to promote TifEagle dominance on greens,” Israel says. “Obviously, temperature and rainfall can alter our conditions and timing of all of our cultural and various application processes. But in a desert climate we usually have predictable weather consistency.”

Fairways, tees and low-cut areas at Stone Canyon are treated with three applications of tebuconazole from late November through mid-January to combat take-all root rot. Spot applications are made for rapid blight in the spring if necessary.

“Again, water management is key to us limiting conditions for disease development,” Israel says. “The deep solid-tining we perform in the summer months along with core aerifications promotes a better environment for healthy turf, which leads to less impact of pathogens.”

At Boca Del Ray Golf & Country Club in Delray Beach, Florida, superintendent **Joe Hubbard** strives to keep the course as disease-free as possible. “Fortunately, we are a Bermuda-based golf course with only three large zoysia tees. That means less disease pressure based on our grass species.”

Historically, Hubbard adds, the course’s 40-year-old push-up Tifdwarf Bermudagrass-contaminated greens with seashore paspalum and encroaching 419 Tifway Bermudagrass had “mass disease” problems. “Once I arrived, we were able to totally change the programs from repeated quick multiple release nitrogen fertilizer applications, extremely heavy scheduling of irrigation and fungicide weekly applications, to a more stable best management practices minimalist program I have had huge success at many clubs before,” he says.

For Bermudagrass courses, Hub-

FAIRWAYS

Frequency of treating fairways with a fungicide during growing season

29%
EVERY TWO WEEKS

21%
EVERY THREE WEEKS

15%
MONTHLY

6%
EVERY OTHER MONTH

25%
BASED ON WEATHER MODELS

4%
NEVER

What are your top three disease concerns on fairways?

DOLLAR SPOT	52%
BROWN PATCH	32%
ANTHRACNOSE	16%
PINK SNOW MOLD	15%
SUMMER PATCH	15%
FAIRY RING	15%
PYTHIUM BLIGHT	13%
SPRING DEAD SPOT	8%
GRAY SNOW MOLD	8%
GRAY LEAF SPOT	7%
TAKE-ALL ROOT ROT	7%
LARGE PATCH	6%
*OTHER	3%
PYTHIUM ROOT ROT	2%
MINI RING	2%
NONE OF THE ABOVE	19%

Other responses include: Bipolaris Leaf spot

Number of fungicides in your fairway rotation



33%
NONE



18%
1 TO 2



28%
3 TO 4



15%
5 TO 6



6%
7 OR MORE



Dollar spot is the top disease concern on fairways and greens, according to survey respondents.

bard urges colleagues to “stay on your cultural practice of keeping the greens on the dry side, verticut what your grass species can handle on a regular basis, topdress as much as your turf can tolerate and use 50 percent or higher slow-release fertilizer, which I usually do with a 1-0-2 ratio on the majors (example 12-0-24).”

Hubbard addresses the causes of disease outbreak, then puts out fungicides based on timing and pressure. “I stay with standard fungicides and rotate some of the newer ones that cover multiple diseases with lower rates,” he says. “Even though we are limited

in our budget for chemicals, our program works.”
Matthew Ayer, director of agronomy at the Country Club of Mobile in Alabama, applies fungicides on four acres of the course’s Mini-Verde Bermudagrass greens. “We only apply preventatives in the spring and fall,” he says. “We then follow it up with curative treatments if we see anything pop up during wet spells. We’re always careful about what time we water greens. We’ll talk to our chemical rep in the winter about what products we will rotate each year. Our close relationship with our chemical rep is probably the most important factor in our success.”

At Sweetwater Country Club in Sweetwater, Texas, superintendent **Ronnie Kingston’s** disease program consists of just greens. “The program is based around historical key diseases, cost and timing,” he says. “Our main

diseases are *Pythium* blight, take-all root rot, leaf spot and dollar spot. I use a lot of broad-spectrum products along with a few specialty products. On the cost side, I use generics for everything except *Pythium*. I usually spray on a preventative 14-day schedule March through the middle of June and middle of September through November. I do curative applications on the other months.”

Todd Kauffman, director of golf maintenance and purchasing for BOYNE Golf in northern Michigan, says the disease control program at the Inn on Bay Harbor starts first thing in the spring. “There are applications based on soil temperatures to help control diseases. Knocking down the fungus early can be a big help throughout the summer in keeping a disease under control. Spraying for *Poa* seed-heads on greens is also a timing spray to avoid a bumpy putting surface.”

Greens represent the most important part of Kauffman’s preventative control program. “We spray our greens every 14 days and target the most prominent diseases we have had issues with in the past,” he says. “We also do a lot of cultural practices and water management to avoid disease, things like verticutting and dew removal to help reduce disease pressure.”

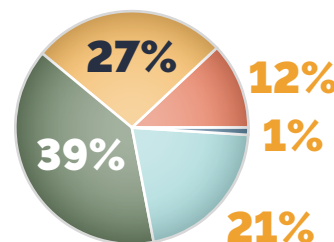
GREENS

What are your top three disease concerns on greens?

50% DOLLAR SPOT	42% ANTHRACNOSE	26% FAIRY RING	26% PYTHIUM ROOT ROT	23% BROWN PATCH
23% PYTHIUM BLIGHT	22% PINK SNOW MOLD	16% TAKE-ALL ROOT ROT	10% OTHER	7% GRAY SNOW MOLD
7% SPRING DEAD SPOT	7% GRAY LEAF SPOT	3% MINI RING	2% LARGE PATCH	2% NONE OF THE ABOVE

Other responses include: Algae, bipolaris leaf spot, rapid blight, Waitea patch

Number of fungicides in greens rotation



NONE ■ 1 TO 3 ■
4 TO 6 ■ 7 TO 8 ■
9 OR MORE ■



The combination of plant protectants and cultural practices have been successful in reducing disease. “A good program can be very time-consuming,” Kauffman adds, “but the end result for the health of turf and guest satisfaction is priceless.”

Mike Kitchen, superintendent at Teton Pines Resort & Country Club in Wilson, Wyoming, admits he is fortunate. “The only disease issues

we have are snow mold, Waitea patch and a little necrotic ring spot,” he says. “We focus most of our disease control efforts on greens, tees and fairways. We start our snow mold control efforts on greens and tees in late August.”

Kitchen makes six applications on tees and greens for snow mold and another application for Waitea patch on greens around July 1. “It’s not terribly time consuming. It takes one worker about three and a half hours for each application for greens and tees, and one person 12 hours for treating fairways.”

Kitchen adds, “Our programs are very successful and 100 percent necessary. Without it, there is no golf in the mountains.”

Kurt Jensen, superintendent at Warminster’s Five Ponds Golf Club in southeastern Pennsylvania, also says greens are the most important piece of property on his course. “I spray them on a weekly basis from early May through early November. Depending on the weather from November to March, I might spray the greens once a month. I rotate the fungicides depending on the time of season and the severity of the weather.”

The more humid and hotter it gets, the more expensive the sprays get, according to Jensen. “I will use a combination of fungicides,” he adds. “The disease, insect and weed pressure reaches its max in late June and July. Mother Nature dictates how and what I spray.” Once a month, Jensen applies a fertilizer soil spray with a wetting agent on the greens.

This is not to say that tees and fairways are unimportant to Jensen. “The tees are under constant pressure,” he says. “The goal is to spray the tees and fairways every 14 to 17 days. Usually, whatever I’m spraying on the tees, I’m also spraying on the fairways. I keep it simple, a generic systemic fungicide and an inexpensive contact fungicide. I don’t have a lot of options with a tight budget. The surfaces get a lot of fertilizer, granular and foliar.”

Stephen Hicks, superintendent at

Projected 2022 fungicide budget compared to 2021

20% OR MORE INCREASE	2%
10% TO 19% INCREASE	16%
1% TO 9% INCREASE	33%
THE SAME	47%
1% TO 9% DECREASE	1%
10% OR MORE DECREASE	1%

Bull’s Bridge Golf Club in South Kent, Connecticut, utilizes check plots to help him understand disease pressure and prevalence on the course. Dew removal practices are used as much as possible.

Fairway drainage installations at Bull’s Bridge have also been key in disease management. “Our wettest hole is now the first one we can mow after a saturating rain event. It is the foundation to our plant health program.”

Hicks keeps an “open ear” to learn of new products from peers and academic research, and he modifies his program accordingly. “In the off-season,” he says, “our spray records are reviewed along with notes and journal entries to re-imagine and look for new solutions or cost savings.”

John Torsiello is a Torrington, Connecticut-based writer and frequent Golf Course Industry contributor.

Frequency of treating greens with a fungicide during growing season

16%
WEEKLY

47%
EVERY TWO WEEKS

14%
EVERY THREE WEEKS

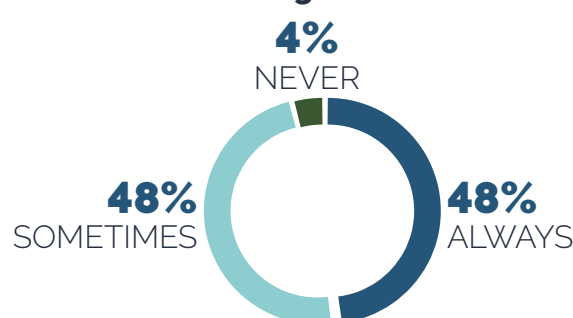
5%
MONTHLY

1%
EVERY OTHER MONTH

16%
BASED ON WEATHER MODELS

1%
NEVER

Frequency of tank mixing fungicides



Take a stand against

the Frightful Five.



Nick White
Golf Course Superintendent

Densicor® controls the fear of turf disease.

Dollar Spot

Brown Patch

Anthraxnose

Snow Mold

Gray Leaf Spot



Densicor®

Introducing your new advantage against the top five most notorious turf diseases.* Densicor® is the ultimate defense against dollar spot, brown patch, anthracnose, snow mold, gray leaf spot and other harmful diseases. Its ultra-low use rate, affordability and strong turf safety profile allow you to spray less while protecting more acres in any climate. Stand up to the Frightful Five with Densicor for exceptional disease control and excellent turf safety across greens, fairways and tees.

Start protecting your turf against the Frightful Five and visit es.bayer.us/Densicor

*Dollar spot, brown patch, anthracnose, gray leaf spot and snow mold were the five most common diseases according to a national survey among golf course superintendents.

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