

## Disease control

KEEPING CURRENT WITH FUNGICIDES AND AGRONOMIC PROGRAMS HELPS CONTROL PATHOGENS AND MEET GOLFERS' EXPECTATIONS

by  
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**O**n a warm, sunny morning, superintendent Sam Samuelson, a certified golf course superintendent with Capital City Golf, a golf course management company based in Sacramento, Calif., starts his morning patrolling Haggin Oaks Golf Complex, a 36-hole public facility. During the hot summer months, daily tours are crucial. Like superintendents throughout the country at that time of year, Samuelson heads out to inspect his greens, check for dry and wet spots, and let his natural instincts take

over as he looks for the subtle clues that might be warning signs.

Samuelson is looking for signs of outbreaks of pathogens such as brown patch, dollar spot or pythium, and he knows he must be diligent. The stakes are high because any major infestation that leads to the turf loss can lead to lost play, lost profits and possibly lost jobs.

Obviously, protecting turf from disease is every superintendent's goal and has been ever since the game began in earnest in this coun-

try a century ago. Every superintendent wants to present picture-perfect greens and fertile fairways to a more discerning public. As a result, chemical fungicides have become an important tool to control the natural ravages of pathogens, especially when golfer expectations are high, course competition is stiff and budgets are tight.

Chemical fungicides have experienced a phenomenal evolution since golf courses began using mercury salts in the 1920s to control pathogen growth. These heavy-metal toxins were effective but harmful and were replaced by synthetic compounds in the 1930s and 1940s.

Since then, the turf industry has seen the continuous advancement of materials, including the development of chlorothanil (Daconyl) in the 1960s; the first synthetic systemics in the 1970s; sterile biosynthesis inhibitors in the 1980s; and the advent of broad-range strobilurins in the 1990s. Presently, there are eight major classes of chemical fungicides available to the golf course superintendent.

"We have a lot more tools available to us than we did 20 years ago, but just having more products doesn't mean that it has made my challenge with pathogens any easier," says Samuelson, who has been in the turf industry since 1968. "The golfing public has set higher standards that we are trying to meet. They want faster greens and fairways, but all superintendents understand that speed kills. As we have lowered mowing heights, we are putting more stress on the plants, which leaves them more susceptible to disease."

This has created the paradox of having to use more fungicides to protect turf while trying to control costs.

And this challenge only increases as mowing heights continue to lower. At the Haggin Oaks Golf Complex, Samuelson has seen mowing heights lowered from one inch on fairways and one-quarter inch on greens during the 1970s down to one-half inch on fairways and 5/32 of an inch on greens today.



Photo: Freddy Bird

A protected worker sprays one of the greens at Haggin Oaks Golf Complex in California.

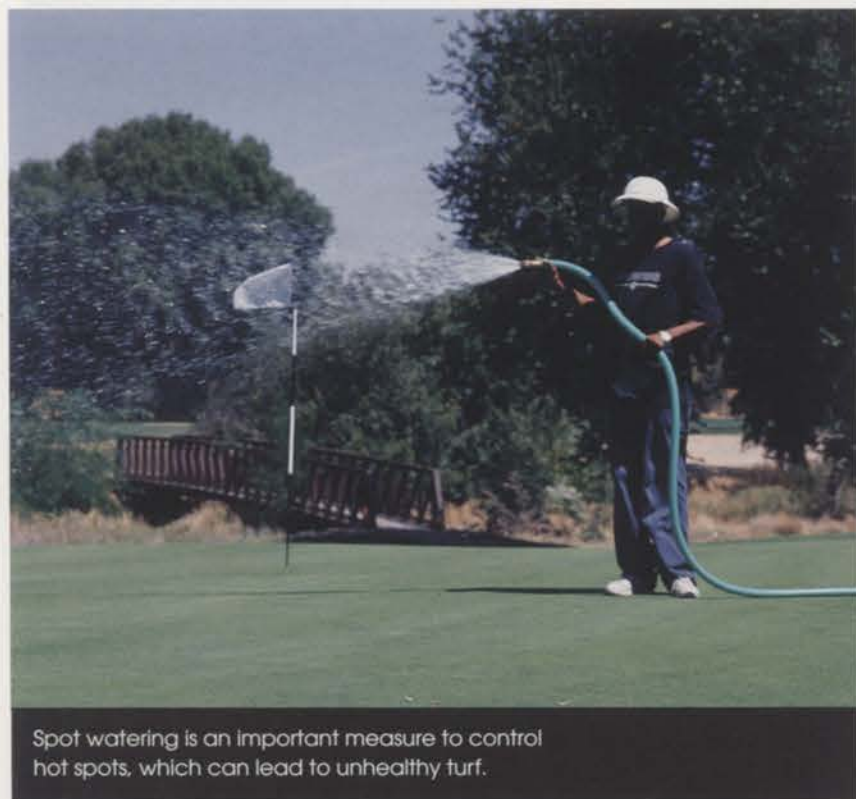


Photo: Freddy Bird

Spot watering is an important measure to control hot spots, which can lead to unhealthy turf.

On the whole, lower mowing heights have become a national trend as courses strive to remain competitive.

Pete Ramsey, superintendent at Range End Golf Club, an 18-hole daily-fee facility in Dillsburg, Pa., near Harrisburg, confirms the pressure to be competitive.

"There is no doubt that the golfing public has put more demands on us to provide a quality product," Ramsey says. "If my greens aren't what they want, then they will go play somewhere else. The challenge for me is to find ways to produce that quality while doing it within a limited budget. Fungicides are part of that equation, but the cost of the newer products forces me to look for other ways to combat pathogens."

Kyle Miller, senior technical specialist for BASF, says he understands the concerns superintendents have about fungicide costs.

"We hear about the cost issue, but the reality is that Environmental Protection Agency requirements are more stringent," Miller says. "It's difficult to get newer products licensed in several markets, and there are fewer companies that are producing products."

"At BASF, we produce products for the agricultural market and the golf market. While the golf sector is only about 5 percent of our total business, the liability involved in golf is greater due to a higher probability of human contact and the cost of golf turf versus open fields. These factors all contribute to the reasons that fungicides for the golf sector are more expensive than the agricultural equivalent."

Joseph DiPaola, golf market manager for

Syngenta Professional Products, says developing a new control agent for the turf and ornamental market can cost as much as \$100 million.

"The size of the investment will probably curtail the introduction of new agents in the future," DiPaola says.

## Maintenance matters

Of course, fungicides aren't the only turf treatment option. Observation and other maintenance practices play an important role in disease-free turf.

Ramsey stresses the importance of sound maintenance practices on his course. Sound maintenance saves on his treatment costs. Because treating a pathogen outbreak with a fungicide on only one hole of a course might wipe out 25 percent of his annual budget, Ramsey uses his resources to develop strong fertility levels, monitor watering and carefully watch for the developing environmental conditions that cause pathogens to appear.

But this approach doesn't eliminate his fungicide use.

"I spray as a preventive measure," Ramsey says. "I have been at Range End for eight years, so I know areas of my course where problems may first appear. These are my monitors. Constant observation and developing a real knowledge of your course's environment are crucial."

Still, deciding on the right treatment is tough. The balancing act between turf protection and cost effectiveness adds up to a difficult decision for most superintendents.

The modern fungicides on the market offer several obvious advantages — namely lower rates and longer protection. Older contact fungicides (chlorothanyl) were effective at a rate of 4 to 8 ounces per 1,000 square feet and provided a seven- to 10-day rate of effectiveness. The first systemics that worked directly on a plant were effective at a rate of 2 to 4 ounces per 1,000 square feet and provided a 14- to 21-day rate of effectiveness. The newer, broad-spectrum fungicides are effective at a rate of 0.13 to 1 ounce per 1,000 square feet and provide a 21- to 28-day rate of effectiveness.

The main drawback of these modern products are their higher price tags. There's also the issue of resistance, which adds another dimension to this complex aspect of golf course maintenance.

Dr. Frank Wong is an urban pathologist at the University of California at Riverside and conducts extensive research about fungicides and their effectiveness in the golf industry.

"The new materials are more powerful than the chemistry in the past, but they have to be looked at as a double-edged sword,"

Wong says. "We have seen how pathogens develop resistance to these new products quicker than in the past."

While Wong acknowledges advantages of the new products, he cautions superintendents to use them as labeled.

"The slogan in the old days was: 'Paint it white and sleep at night' with the contact fungicides, but those days are over," Wong says. "The new products allow for a lower application rate, and their ability to bond to the plant are beneficial in reducing runoff concerns. But it is imperative to follow the guidelines for their use."

Others say not to expect a silver-bullet solution. Paul Miller, certified golf course superintendent of Nashawtuk Country Club in Concord, Mass., is one. Nashawtuk, a private club, hosts an annual Champions PGA Tour event, so the need to be in peak condition has led Miller to use all tools available. Unlike a smaller daily-fee course, he has access to a large budget, which gives him more options.

"The development of the new products has been very beneficial, but it has to be stressed that they are not a silver bullet," Paul Miller says. "The problem of resistance is there, and

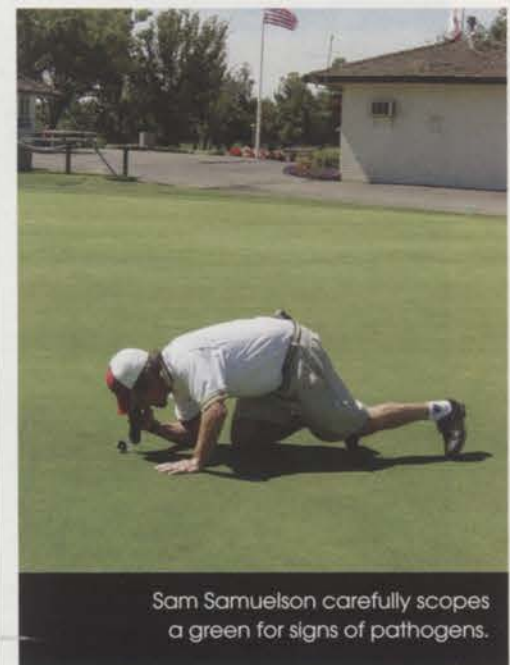


Photo: Freddy Bird

Sam Samuelson carefully scopes a green for signs of pathogens.

it is important to rotate the different classes of fungicides through the course rather than relying on one type of fungicide."

Paul Miller approaches the challenge by taking in all considerations, such as maintaining the course in the condition that members expect, doing it within the budget available and in a way that's environmentally compatible.

"There are two kinds of superintendents: ones who have lost turf and ones who will," he says. "This reality just means that we have to develop a creative balancing act between science and art to protect our golf courses

as best as we can. We need to develop sound knowledge of the use and application of the various chemical products that are available to us and blend that with the natural agronomy practices that we can use to produce healthy turf."

DiPaola says superintendents need to educate themselves about fungicides to help use them more effectively.

"We have made many advances through the newer classes of control agents, but the reality is that resistance to these agents will always be a serious concern," DiPaola says. "It is important that superintendents educate themselves about the various classes of fungicides to understand the chemistry as they develop a program for rotation at their particular course."

edge of the things they can control, such as fertility levels, water monitoring and foot traffic. This also means proper crew training to watch for dry spots, hand-water correctly and cultivate a team effort toward a goal of growing healthy turf.

**3. Educate about fungicides.** Because of the wide variety of products available, it's imperative to know about all the classes of fungicides to be able to decide what type of chemistry will work in any green situation.

Education also requires knowing how to use fungicides properly.

"These products are effective but also powerful," Wong says. "I have seen problems where someone may overuse a product to try to pound out a problem, or where

"The challenge for me is to find ways to produce that quality while doing it within a limited budget. Fungicides are part of that equation ... " — PETE RAMSEY

In the meantime, product advances in the pipeline could simplify use. One advance that will be seen in the near future, according to DiPaola, is a color-coded packaging and labeling system making it easier to identify different classes of control agents.

"Hopefully, this concept could become an industrywide standard in the future to help make defining products easier for those who are using them," he says.

### Fungicide guidelines

The experiences of Samuelson, Ramsey and Paul Miller show that the pressures and challenges of preventing pathogens from developing are similar from coast to coast. Also, several common themes emerge in course maintenance and fungicide use.

**1. Observe diligently.** Samuelson walks his greens twice a day during the summer and includes regular soil and turf samplings and careful monitoring of mowing heights. Ramsey gets drawn in many directions at his course in the summer, and he relies on his staff to help keep a watchful eye on the turf during the busy season. The lesson: Learn which environmental conditions are unique to a course and watch for early warning signs to use fungicides preventively.

**2. Develop a sound agronomic program.** Rather than worrying about what one can't control with Mother Nature, Paul Miller suggests superintendents use their knowl-

someone might try to stretch them out by not applying at the right strength."

**4. Rotate fungicides.** This is key to proper use, no matter where a course is located. Constant use of the same product can lead to resistance from pathogens the fungicide is trying to control. By rotating various products through spraying cycles, this problem can be managed. Education and observation play vital roles in this process.

### Uncontrollable variables

The steps above are factors superintendents can control. Another variable is increasing expectations by the public or course membership about golf course conditions. This isn't something a superintendent can control completely. Golfers might have unrealistic expectations to start because they see a PGA Tour event on TV on a Sunday and want to see this at the course they play on Monday.

Luckily, advances in golf course construction techniques throughout the past 10 years have provided daily-fee golfers better conditions. And they expect those conditions wherever they play.

"The level of acceptability has increased dramatically over the last 15 years, which has led to more spraying," says Ray Viera, golf course superintendent of The Members Club at Four Streams, a private club in Beallsville, Md. "I can accept some signs of aesthetic pathogens, but members might not. I just take pride in knowing that I am



Photo: Freddy Bird

Low mowing heights increase stress on turf and make it more susceptible to disease.

doing everything possible to provide the best conditions, but I wonder where are we taking conditions and how do I pay for it?"

While superintendents understand what it takes to bring a golf course to PGA-Tour quality, the average golfer is unaware of the price to produce these conditions. As a result, developing some form of communication between a golf club's membership or the course general manager becomes crucial to set thresholds of acceptability for a particular facility. These thresholds should address course cost, environmental effects and how this translates into green fees.

"We are all being challenged to get a bigger bang for the buck, so developing the communication with management is essential," Paul Miller says. GCN

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Photo: Nashawtuk Country Club

Paul Miller, superintendent at Nashawtuk Country Club, uses chemicals and natural agronomy practices to produce healthy turf.