



FUNGICIDE Frustration

BY FRANK H. ANDORKA JR., ASSOCIATE EDITOR

When gray leaf spot or brown patch symptoms appear on golf courses, fungicide resistance isn't on the mind of worried superintendents. They're thinking about how members will react when the disease wipes out 14 of 18 fairways and how they'll explain what happened at the next green committee meeting. So they head out with the latest technology in fungicides to eradicate the problem.

So far there's only anecdotal evidence of fungicide resistance in turfgrass (although there is scientific evidence of it in the agricultural world). But it suggests fungicide resistance should rank higher in superintendents' minds.

The cost of ignoring the issue may equal the danger of disease itself. Once resistant strains evolve, no amount of fungicide can undo the damage.

Though scientists disagree on how widespread fungicide resistance is, there are steps superintendents can take to avoid it. Researchers suggest tank mixes and product rotations, as well as more accurate disease diagnosis, to stave off widespread resistance to current products.

"Superintendents are going to have to be a lot smarter about how they're applying their fungicides," says Jim Walter, turf and ornamental marketing manager and research and development manager for Rohm and Haas. "They will have to pick and choose more carefully what products to use and where. For the most part, superintendents are already being that smart."

Concerns about resistance surfaced last year when researchers heard tales about fungicide-resistant strains of dollar spot, particularly in the East, says Joe Vargas, professor of plant pathology at Michigan State University.

The battle over disease resistance heats up as scholars scramble to figure out what's *really* going on

"We were getting reports of dollar spot that was resistant to everything but Daconil, which was partially restricted by the Environmental Protection Agency last year," Vargas says. "That's going to cause problems at a lot of golf courses that suffer from that disease."

Vargas says superintendents were also reporting lower efficacy than they expected. He says fungicide suppliers are in a

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RESISTANCE RESEARCH

Wakar Uddin, assistant professor of plant pathology at Penn State University, understands how important it is for superintendents to know whether resistance to azoxystrobin by gray leaf spot fungi exists or not. That's why he launched what he calls a significant study on the issue.

"We can't overlook the possibility of resistance simply because we've never had a scientifically documented case in turfgrass," Uddin says. "It has been reported in several agricultural crops, so it may be worthwhile to investigate the gray leaf spot system as well. The timing is right!"

Uddin, along with Syngenta researcher Gilberto Olaya, will monitor cultures of gray leaf spot throughout the spring and summer on more than 50 courses throughout the Northeast. "We're concentrating our efforts on gray leaf spot because we've been hearing some rumblings of problems," Uddin says.

Uddin says he expects to report his results next year.

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bind because products with targeted efficacy promote resistance, but higher-dose, broad-spectrum fungicides raise red flags at the EPA. "It's a Catch-22," Vargas says.

"The EPA is working as the gatekeeper on the front-end and the regulator on the back end," Walter says. "You may see a change with the new administration. It would certainly be nice."

FAMILIES OF FUNGICIDES FOR TURFGRASS 2001

Chemical family: Dithiocarbamates		
COMMON NAME	TRADE NAMES ¹	CONCERN OVER RESISTANCE
Mancozeb	Fore, Mancozeb, Dithane T/O, Protect T/O	Low
Thiram	Spotrete	
Chemical family: Dicarboximides		
Iprodione	Chipco 26019, Chipco 26Gt	Moderate to High (not persistent)
Vinclozolin	Touche, Curalan	
Chemical family: Benzimidazoles		
Thiophanate-methyl	Fungo 50m, Cleary's 3336, Cavalier	High
Chemical family: Sterol inhibitors or Demethylase inhibitors		
Fenarimol	Rubigan	
Myclobutanil	Eagle	High
Triademelon	Bayleton, Accost	
Propiconazole	Banner MAXX	
Chemical family: Strobilurins		
Azoxystrobin	Heritage	Moderate to High
Trifloxystrobin	Compass	
Additional Fungicides...each in a different chemical family		
Chlorothalonil	Daconil, Manicure, Concorde	
Flutolanil	ProStar	Low
PCNB (pentachloronitrobenzine)	Terraclor, Turfcide, Revere, FFII, PCNB, Defend, Engage	
Pythium (Oomyces) Fungicides...each in a different chemical family		
Mefenoxam	Subdue MAXX, Apron (seed treatment only)	High
Propamocarb	Banol	Low
Fosetyl-Aluminum	Prodigy, Chipco Signature (Aliette)	Low
Azoxystrobin	Heritage	Moderate to High
Chlorneb	Teremec Sp	Low
Ethazol (Etridiazol)	Koban, Terrazole	Low

¹Product list by trade name may not be all inclusive.

SOURCE: J.W. RIMMELSPACH & M.J. BOEHM
The Ohio State University, Department of Plant Pathology

No silver bullet

Superintendents must remember that there's no silver bullet to take care of fungal diseases indefinitely, says Peter Farno, business manager of Chipco Professional Products' fungicide division.

"Superintendents are under a lot of pressure to get rid of disease quickly," Farno says. "Sometimes, that leads them to find a product that works and use it over and over. Unfortunately, that's when you can run into problems."

Think of fungi as fortresses with multiple entry points, and fungicides as troops trying to storm them. If the fungicides insist on attacking the same door each time, eventually the fungi will adjust and bar the door. On the other hand, attacking a variety of entry points at the same time increases the fungicide's chance of success.

Mike Agnew, technical support representative for Syngenta, says his company recommends no more than three or four applications per year before rotating to another product.

"We provide resistance management training for all our sales reps so they can train superintendents about the best program to follow," Agnew says. "We want superintendents who use our products to understand them as well as they can."

Jeff Barnes, biology project leader for the fungicide division of BASF, recommends the following three guidelines for product rotation:

- Don't use a single chemical family of fungicides for more than (For example, if the normal rotation is nine applications to kill dollar spot, superintendents should use sterol inhibitors or demethylase inhibitors only for three of them).

- Limit the number of sequential applications of similar chemistry to no more than two per season.

- Alternate chemistries on a strict schedule.

"If superintendents follow the basic rules for rotation, these products will remain part of their arsenal for a much longer time," Barnes says.

But some scientists question whether

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all reports of resistance are accurate. Mike Boehm, assistant professor of plant pathology at The Ohio State University, says superintendents shouldn't forget that they're not applying fungicides in a vacuum. Environmental factors, such as precipitation level and soil temperature, also affect fungicides' effectiveness.

"When people tell me that they're getting resistance to their fungicide programs, I have a list of 20 questions I immediately ask them," Boehm says. "Sometimes, the issue isn't resistance. It can be as easy as changing fertility schedules."

Superintendents should keep their composure, even if they don't see immediate effects of their usual fungicide, says John Watkins, a professor of plant pathology at the University of Nebraska. Hitting the disease with another broad-spectrum blast soon after the first could intensify the problem, he says. "Try not to hit the panic button too early," Watkins says.

Wakar Uddin, assistant professor of plant pathology at Penn State University, agrees.

"There are definitely some resistance issues," Uddin says. "Fortunately, because superintendents are well informed and have significant experience with fungicides, the problem isn't as widespread as it could be. That's encouraging."

"The only way we will know about the fungicide sensitivity is through research experiments," Uddin adds. "I would like to find out about any problems now rather than later, especially with gray leaf spot."

Uddin, along with Syngenta's Gilberto Olaya, launched an in-depth study of fungicide resistance in gray leaf spot in February. Uddin says that while the turfgrass industry can't overlook resistance issues, there hasn't been a scientifically documented case.

"That leads some of us to ask, 'Is what some superintendents are experiencing really resistance or is it something else?'" Uddin says. "That's the mystery we're currently trying to unravel in the Northeast." ■

IS THE PRICE RIGHT?

By Pat Jones, Publisher/Editorial Director

Fungicides, perhaps more than other chemicals in the market, have created budget challenges for superintendents. Unless you have a crystal ball to predict weather patterns, you rarely know how much you'll need during a season.

Pricing is, however, another matter. Historically, the final price a course paid for a fungicide purchase was based on a mix of quantity, relationship with the distributor and, of course, haggling. However, the emergence of so-called "agency" pricing has changed that dynamic — and brought mixed reviews from superintendents.

Agency pricing is a transaction where a distributor never actually purchases a product from a manufacturer. Instead, a distributor acts as an "agent" for the maker and sells the product on its behalf at a predetermined price. In return, the agent receives a commission based on a scale set in advance by the agreement. No muss, no fuss — and no haggling.

Manufacturers like it because it simplifies the supply chain and makes the market — and margins — more predictable. Distributors like it because there's less of the risk associated with buying and inventory of product that they must store and resell.

Some superintendents like the concept. "I don't mind it [because] that's one less thing I have to 'shop' for," says Parin Schmidt of Glenwoodie GC in Glenwood, Ill.

The lack of competitive pricing led Walter Montross of Westwood CC in Vienna, Va., to embrace agency pricing. "Over the last couple of years, buying from the lowest bidder didn't amount to much difference," he says. "What I really want to do is support the [local] companies that have taken care of me."

Superintendent Ed Walsh, now building a new course in Pennsylvania, also makes his decision based on local support rather than price. "Agency pricing helps keep the small vendor in business," he says.

For others, the notion of fixed pricing doesn't sit well. "It takes away the incentive to be better than the other (dealers)," says Jay Buck of Meadowlands CC in Bluebell, Pa.

To others, it just seems wrong. "Agency pricing is price fixing, and I don't like it," says Terry Bonar, CGCS of Cleveland's Canterbury GC.

Herb Watson of Hartford (Conn.) GC

shares that view. "I can't understand how the manufacturers can get away with this kind of price fixing," he says. "However, I do understand how it can help the little distributor stay alive."

Among manufacturers and distributors, a new debate over agency pricing has emerged with the growth in sales of "post-patent" chemicals. One specific example involves generic chlorothalonil-based products that are marketed as an alternative to Daconil. Since the patent protection for Daconil expired a decade ago, Griffin LLC and Sipcam Agro USA have launched generic versions of Daconil that they say provide similar control but at lower prices or with different product benefits.

The problem, according to both companies, is that Syngenta uses its agency pricing agreement with distributors to create an incentive to sell the Daconil brand. According to Griffin's general manager, Owen Towne, the agreement reduces the standard agency commission on sales of Heritage, Primo and other Syngenta professional products if the distributor chooses to sell a chlorothalonil alternative like his company's Concorde brand or Sipcam's Echo.

"We're certainly not against agency, but we think this limits a choice for superintendents," Towne says. "We'd like to see a level playing field where distributors weren't forced to choose."

Bob Yarborough, Sipcam's business manager for T&O products, says: "I've lost key distributors because they didn't want to be 'dis-incentivized' under agreements like this. The loss to superintendents is the loss of choice and with the loss of choice comes higher prices."

Keelan Pulliam, who heads Syngenta's professional products group, says the company's agency program "in no way" restricts a customer's choices. Instead, it simply creates incentives for distributors to carry the company's full product line.

"We have the most extensive product line in the industry, and we want to encourage distributors to sell all of our brands as well as Daconil over other brands," Pulliam says. "These kinds of incentives ultimately don't restrict a superintendent's choices or access to alternative products. On the contrary, superintendents have more choices, particularly in terms of fungicides, than ever before." ■