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The Bent Creek Country Club sprays greens with low rates every week, and it treats tees and fairways every 14 to 21 days.

*Continued from page 60*

“By changing in a rotation, all you have ended up with is something that is resistant to everything,” says Kent Turner, superintendent of Brookside Country Club in Canton, Ohio. “Or you can use just one until it is done. It’s against contrary belief, but it tends to lead more toward the medical side (like antibiotics).”

While the theory makes sense, Turner tends to rotate chemistries and tank mix. His 85-year-old Donald Ross course has seen its share of chemicals, and not all of them work anymore.

“Thiophanate-methyl does not work on dollar spot here, but we still use it for anthracnose. (Triadimefon) is another one that does not work a day for dollar spot,” Turner says.

They might not work like they used to, but Turner still throws some down during high-stress times of the summer to try to instigate some residual effects, especially since the Environmental Protection Agency’s rules to limit chlorothalonil products went into effect. (Visit [www.turfgrasstrends.com](http://www.turfgrasstrends.com) and

### How Long Does it Take for Resistance?\*

- Benzimidazole: 2-3 years
- Dicarboximide: 3-5 years
- DMI: 3-5 years
- Strobilurins: 2-3 years
- Phenylamides: 2-3 years
- Phosphonates: not yet
- Chloronitriles, Dithiocarbamates: not yet

\*Agricultural examples

Source: Rick Fletcher, Cleary Chemical Corp., 2005

search “chlorothalonil” for a guide to EPA restrictions.)

“It does require more strategy with the new regulations,” he says. “The strobilurin-type fungicides have certainly helped with anthracnose for people who had resistance with (thiophanate-methyl). It would be nice in the future if some of the pharmaceutical companies could come up with another contact fungicide for dollar spot (to augment chlorothalonil applications). But it appears that there isn’t a lot in the pipeline because the EPA seems to be stricter on contacts.”

Part of the reason the EPA is so tough on products approved for turf is because it opens the door for residential applicability, which means children could be exposed to chemicals. For example, the EPA finally approved Syngenta’s new insecticide Meridian for turf in February even though the chemistry had been approved in ornamentals since 2003.

### Common practices

Many superintendents have adopted a fungicide program that focuses on prevention to combat the chlorothalonil restrictions.

Jim Nicol, the certified superintendent of Hazeltine National Golf Club in Chaska, Minn., sprays fungicides every two weeks to stay atop the course’s anthracnose problem. He typically applies a sterol inhibitor with a contact, then he rotates his chemistries about every third application, beginning in early April.

“There are some pathogens that some chemistries work better on than others,” Nicol says. “So we rotate between contacts and systems depending on specific pathogen pressure, and we are always tank mixing at the lower rates for synergistic values.”

Frequent applications at low rates keeps the Canterbury Golf Club in Beachwood, Ohio, relatively disease free, too. Certified superintendent Terry Bonar says dollar spot is a pesky pest almost all summer.

“Dollar spot is a lot harder to get rid of than it is to keep out,” Bonar says. “So we use very low rates every week almost without fail.”

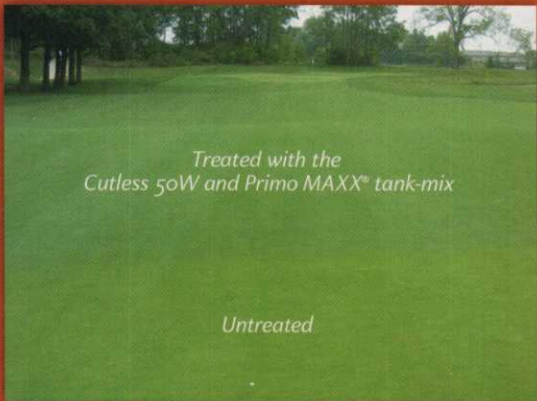
Bonar begins his program in early April with an iprodione application for leaf spot

*Continued on page 64*

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It's important to experience and understand soil tests so the necessary fertilizers can be used to keep turf healthy.

*Continued from page 62*

and sometimes an application of triadimefop if weather permits.

But Bonar's favorite preventive by far is chlorothalonil, which he applies at a fraction of the labeled rate (about 0.7 of an ounce) once his program is in full swing in early May through September.

"You don't find much resistance with contacts," he says.

Bonar sprinkles in a triadimefop application (a systemic) on June 1 and July 1 to help prevent anthracnose, and he'll combat brown patch outbreaks with a strobilurin.

The remarkable thing is that Canterbury sprays tees, greens and fairways on each application. It sounds expensive, but Bonar says he's able to keep his budget in control by using low rates to prevent disease instead of reacting to outbreaks with curative sprays at higher rates. About \$35,000 covers his expenses.

"I'll bet I don't have the highest fungicide budget (in the area) but because we spray at light rates every week, we can put down four applications to their one application."

Similarly, Jim Loke, certified superintendent of Bent Creek Country Club in Lancaster, Pa., begins his program fungicide program in March, and he rotates applications between a contact, systemic and sterol inhibitor for about three months.

"Then beginning in June, I begin tank mixing a contact with a systemic or a contact with a sterol inhibitor pretty religiously," Loke says. "On my greens, I spray low label rates on a seven-day period. And tees and fairways are sprayed on a 14- to 21-day cycle following the same chemistry of rotation."

But Loke says it's important to know why you are spraying certain chemicals. His program appears to be a bit like a shotgun approach: scattering all types of materials in hopes that one will work. But it's really more like a revolver: using specific chemistries to combat known disease pressures in conjunction with turf health and soil composition.

"Interpreting soil test results takes time and experience, and it's important to begin that process and really become educated and

### Aligning the Right Chemistries

Currently, there are 37 different modes of action to manage diseases. Turf managers could be increasing the odds of pathogen tolerance if they fail to select chemistries that complement each other. Luckily, there's a resource to ensure fungicide mixes are synergistic.

The Fungicide Resistance Action Committee (FRAC) was created to help crop producers manage disease resistance. The major chemical manufacturers support it, and it provides use guidelines, information about product modes of action, resistance updates, persistence of resistance isolates and descriptions of the FRAC code displayed on most products. The FRAC codes are numbers and letters used to distinguish the fungicide groups according to their cross-resistance behavior.

It also archives research and provides forums on fungicide families and specific chemistries.

Visit [www.frac.info](http://www.frac.info) for more information.

experience what fertilizers are necessary and important to keep the soils healthy and therefore keep the grass healthy," he says. "That's really evident when dealing with basal anthracnose; fertility seems to be the most important element in healing, repairing or preventing basal anthracnose."

Technical aspects of a spraying program can have significant effects on product efficacy as well. Tires lose air, and nozzles clog and wear, which makes it important to calibrate equipment before each use to obtain desired spray volume and results. Also note that manufacturers recommend that golf courses limit the number and timing of treatments and maintain recommended dose rates and intervals.

Certain chemistries and chemistry combinations work better depending on the season and disease pressure.

And some chemistry might not work well at all. Nicol says he remembers benomyl being heralded as the silver bullet for turf disease. It was a cure-all for a while — about a year. Then, it didn't work on anything.

"I wouldn't jump on any bandwagon right away," Nicol says. "I'd let a little time go by before you can really evaluate what's better than the other." ■

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CELEBRATING 70 YEARS OF INNOVATIVE TECHNOLOGY | UNPARALLELED CUSTOMER SERVICE

**W**ith summer stress periods on the horizon, golf course superintendents often wonder why turfgrass species that are so carefully maintained are

so easy to lose. From a management perspective, what makes for a stable putting green? Ecologically, one misnomer is that complexity leads to stability, suggesting single- or two-grass species greens are unstable.

The generally held belief that complexity enhances the stability was based on early “conventional wisdom” in ecology that increased complexity — as in, increasing number of species — increases stability. This wisdom, developed in the late 1950s and 60s, was based on several statements, one of which tended to resonate through the agronomic discipline that crop monocultures were ecologically unstable communities because they were especially susceptible to destruction by pests or environmental disturbances.

As research progressed in the 1970s, many of the statements that complexity added to stability were found to be untrue or could be interpreted at best in another fashion. For example, the crop monoculture statement ignored the difference in co-evolution between natural and agricultural systems, and that many crops are early successional species, which by definition are subject to rapid change.

As research continued into plant communities and sophisticated mathematical models that looked at increased species number were developed, bonding and interactions among the species, studies found that increasing complexity lead to instability. Studies, which began in the 1970s, had ecologists comparing species-rich and species-poor communities. They found that when a disturbance occurred the species-rich communities lost diversity, and never returned to the pre-disturbance community, while the species-poor were more likely to return.

Ecological stability is based on two components, resiliency and resistance. Resiliency is the speed at which a community returns to its former state after a disturbance or displacement. Resistance is used to describe a community’s ability to avoid displacement or dislocation.

## When Are Golf Greens Stable?

BY KARL DANNEBERGER



ECOLOGICAL  
STABILITY IS BASED  
ON RESILIENCY  
AND RESISTANCE

Of special interest when discussing stability is *Poa annua* putting greens. Initially established to desirable turfgrass specie(s), these greens changed to *Poa annua* from disturbances either environmentally or biologically (pests, and management). As *Poa annua* greens, they exhibit high resiliency and resistance to change.

When *Poa annua* greens are disturbed by pests and environmental or management stress, the greens often return to their predisturbance state. In other words, when *Poa annua* dies, it is a good bet that *Poa annua* will return. These greens also exhibit a high degree of resistance. Anyone who has tried to convert *Poa annua* greens to creeping bentgrass knows what I’m talking about.

The final component that’s important in community stability is the environment. Either on a global or local level, communities or species that exhibit adaptation or characteristics within a narrow range of environmental conditions are considered to be dynamically fragile, while those adapted to a range of conditions would be considered dynamically robust. Although *Poa annua* is found globally, greens managed at current levels exhibit a more fragile nature. Greens managed well within the desirable environmental conditions do well and are desirable; those on the fringes of environmental adaptability are at greater risk.

Finally, I would say that the relationship between the complexity of a community and its inherent stability in a global sense is not always clear. It may vary with the exact nature of the community — in our case a putting green and how it is damaged, and from a scientific perspective the way stability is assessed. However, with many ecological systems the overall tendency for stability to increase comes with decreasing complexity.

*Karl Danneberger, Ph.D., is Golfdom’s science editor and a Ohio State University turfgrass professor.*

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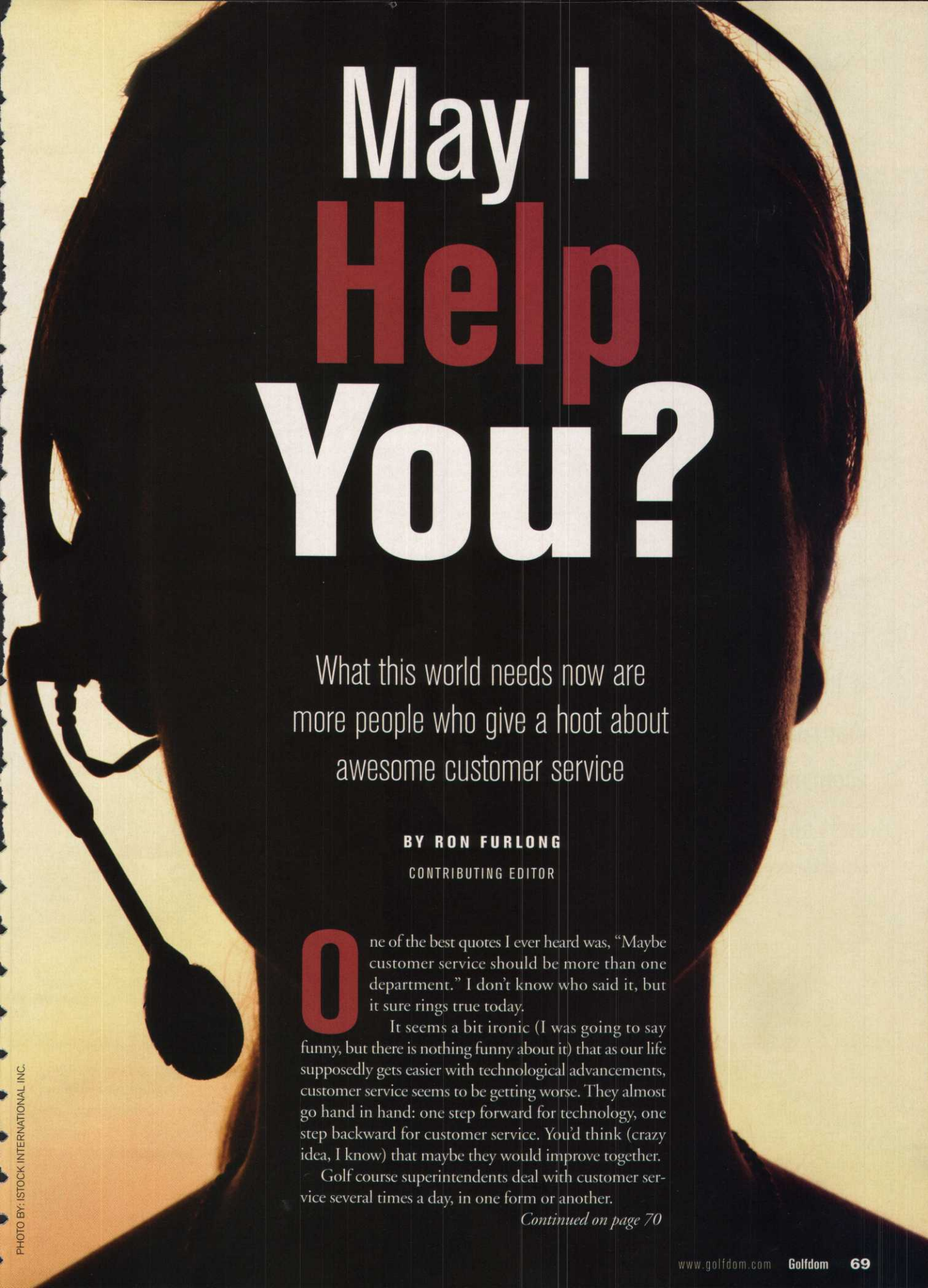
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# May I Help You?

What this world needs now are  
more people who give a hoot about  
awesome customer service

BY RON FURLONG  
CONTRIBUTING EDITOR

**O**ne of the best quotes I ever heard was, "Maybe customer service should be more than one department." I don't know who said it, but it sure rings true today.

It seems a bit ironic (I was going to say funny, but there is nothing funny about it) that as our life supposedly gets easier with technological advancements, customer service seems to be getting worse. They almost go hand in hand: one step forward for technology, one step backward for customer service. You'd think (crazy idea, I know) that maybe they would improve together.

Golf course superintendents deal with customer service several times a day, in one form or another.

*Continued on page 70*

May I Help You?

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Good customer service tries to exceed expectations at the point of initial contact.

Superior  
customer service  
is the foundation  
that successful  
companies are  
built on.

*Continued from page 69*

I want to focus on the customer service we are receiving on a daily basis — from the fertilizer salesman to the dispatcher at the sand-pit to the credit card representative for your company card to the travel agent booking your trip to the Golf Industry Show in Orlando next year. In the course of a normal business day, you might deal with as many as a dozen customer service reps (even though quite often many of these people would not consider themselves customer service agents), and that's just for your golf course duties. Add another half dozen for your daily personal life and suddenly you have a heckuva devotion to dealing with people who you want to help you. When as many as half of those people are unable to help you or they help you in a manner that you consider unfriendly or even hostile, it can make us all a little frustrated, stressed and disillusioned.

Here's an example of a recent call I made to my credit card company.

**Rep:** "May I help you?"

**Me:** "Yes, I have a question regarding my account."

No answer.

**Me:** "Hello?"

**Rep:** "Yes."

**Me:** "Would you like my account number?"

**Rep:** "Sure."

**Me:** "55555555."

**Rep:** "OK."

**Me:** "Well, I had a question regarding my bill. I just received the statement yesterday, the 14th, and I noticed the bill is due on the 22nd."

Long pause.

**Rep:** "And your question is . . .?"

**Me:** "Well, I don't think that's enough time to pay it. It's only eight days."

**Rep:** "Would you like to change the date your bill is due each month?"

**Me:** "No. I'm just asking that the bill arrive sooner than eight days before the payment is due."

Another long pause (I think maybe even the faint hint of a sigh).

**Rep:** "I don't think that can be changed."

**Me:** "So maybe it can?"

**Rep:** "Pardon?"

**Me:** "You said you don't think it can be changed. To me that means maybe it can. Can you find out?"

**Rep:** "Sir, please don't get rude. Please hold, and I'll talk to my supervisor."

Click. Mozart's Jupiter symphony comes on, which does actually calm me some. Six minutes later my calmness is beginning to fade a bit when another representative comes on.

**Rep 2:** "Can I help you?"

**Me:** "I was on hold with someone else."

**Rep 2:** "Oh. Please hold."

Three minutes later, I'm disconnected.

This is an extreme example, I'll admit, but I'm sure we all, unfortunately, have a similar story and probably more than one. Customer service is awareness of needs, problems, fears and aspirations. Customers who don't get support become someone else's customers. Consider the old saying: "I won't complain. I just won't come back." Although I'm actually the guy who will complain and then not come back.

Mike Erb, a representative of Wilbur Ellis, is one of the most respected fertilizer/chemical salesmen in the Seattle area. Not only does he know his products and know his stuff agronomically, but he also actually cares about his clients and their successes. Mike's the guy who calls you after you've bought his product and applied it to see how it went and how the turf is doing. He often comes out to see the fairways or greens for himself.

"Excellent customer service does not just happen in today's competitive business environment," Erb says. "Superior customer service is the foundation that successful companies are built on. Exceptional customer service principals have to be continually practiced and improved on."

Shane Riley, a sales representative for UAP

*Continued on page 72*