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structure of the tree also can rob the green of water and other essential nutrients.”

Short and his assistant do all of the syringing at Cherry Blossom.

“I feel syringing greens is one of the most critical jobs done on a golf course and shouldn’t be left to untrained hands,” he says. “My staff is relatively limited and I would rather be in control of how much water is go-

ing down on the greens. I firmly believe that whoever is syringing must truly care about what they are doing and understand why they are doing it, as opposed to just doing a job.”

Short typically tackles hot spots with hoses rather than the irrigation system or specialty equipment.

“The only time I’ll use the irrigation system to syringe is if I have more than one fire to put

out,” he says. “I’ll throw up the heads for just a minute or two to cool of the surface and hopefully keep things in tact until I can get to it.”

A SYSTEMATIC WAY

Kevin Hutchins, superintendent at Mission Viejo Country Club in Mission Viejo, Calif., developed the MobileMist to have a systematic way to measure temperature canopy on greens and an efficient, repeatable way to cool the temperature canopy of the greens.

“I found in the past that each employee monitored the greens in their own way and many times they would turn on the sprinklers or use a hose for too long a period of time when syringing the greens,” he explains. “Many times the staff were actually irrigating the greens instead of syringing.”

Hutchins was also looking for ways to conserve water.

“When you run the sprinklers for three minutes to syringe the greens you use 5,700 gallons of water each day,” Hutchins says. “Over a 90-day summer, that is more than 500,000 gallons of water to try to cool the greens. With the MobileMist, on a really hot day, you use just 50 gallons of water, which is only 4,500 gallons over the entire summer.”

The MobileMist comes with a laser temperature gun and a log book. Hutchins says each day a staff member shoots the green with the laser and records the temperature in the log. He uses 94 degrees as his trigger to start using the MobileMist to cool the greens.

What he loves about the system is that it’s very repeatable and anyone can do it.

“If the temperature is above 94 degrees the staff member runs the MobileMist around the green in about two minutes,” Hutchins explains about the system. “The temperature is measured again and recorded in the book. The average temperature drop is about seven to 10 degrees depending on the wind and the humidity. I start on hole No. 18 and go backwards until all the greens are checked and cooled as needed.

“I then go back to 18 and recheck the greens. If the temperature is above 94, I mist them again,” he adds. “If 18, 17 and 16 greens are below 94 degrees, the employee can pack up and go home for the day. It is a repeatable system with little room for error.” **GCI**

David McPherson is a freelance writer based in Toronto.

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**RX FOR
CONVENIENCE
OR
MULTIPLE
DISEASES?**

**A LOOK AT FUNGICIDE COMBINATION PRODUCTS
— THEIR BENEFITS AND PITFALLS.**

SIGNATURE: **BY DAVID MCPHERSON**

Your nose is runny, your throat hurts and you're congested. Do you buy three medicines to treat each symptom, or will one drug do? Frank Wong, an associate specialist in cooperative extension at the University of California-Riverside, uses this analogy to describe the growing popularity among superintendents to use fungicide combination products to combat common turfgrass diseases.

"If you look at the number of active ingredients in cold medicine, you are going to see three or four different ones," Wong says. "That makes sense because you just don't want to get rid of your chest cough or your runny nose – you want to get rid of all the symptoms. The same can be said for pre-packaged fungicide combination products: With one application you can treat several diseases."

Examples of diseases where fungicide mixtures are very effective include anthracnose, snow mold, gray leaf spot and dollar spot. Wendy Gelernter, co-owner of PACE Turf, a membership organization that provides research, education and information services to the turf management community, says fungicide combination products allow superintendents to avoid physical or chemical incompatibility problems and they target multiple diseases simultaneously, saving superintendents time.

"If you want to target a foliar disease such as anthracnose, as well as a root disease, such as summer patch, rather than worrying about compatibility issues and taking the time to separately measure out and apply chlorothalonil (Daconil Weather Stik) and

propiconazole (Banner Maxx), it might be more convenient to apply a single product, such as Concert, which contains both of these active ingredients," Gelernter explains.

Besides convenience, fungicide combination products can be good for the superintendent's bottom line. For example, the fungicide Headway is practically a mixture between Heritage and Banner, so to buy this combination product may be cheaper than tank mixing the correct rate of these two active ingredients.

While it's difficult to argue the benefits of these fungicides, critics wonder if these combination products are merely a marketing gimmick by manufacturers to sell more. According to Wong, that's a possibility. However, the reality is since there are more government and environmental restrictions today on the use of fungicides, superintendents are constantly looking for ways to lessen their environmental impact while still treating multiple diseases and keeping the turf healthy for golfers.

"Back in the old days, when you had mercury salts, cadmium salts and even something like chlorothalonil, you didn't have to worry too much because you could spray with them and there was a good chance you could pick up a lot of different diseases," Wong says. "Now, with materials having to be extremely site specific, and have virtually no non-target effects, that's a tall order to engineer something that is going to kill fungi, but not affect birds, algae or earthworms, and also get past state and federal registration standards.

"So, all of a sudden you have materials such as Emerald from BASF. It's a really good

“The less you have to spray, the better off you are.”

–Mike Powers, Edina (Minn.) Country Club

Table 1. Active ingredient levels in single-ai fungicides vs. combination products.

Single ai Product			Combination Product	
Active Ingredient (ai)	Product name	oz ai/1,000 sq. Ft.	Product name	oz ai/1,000 sq. ft.
azoxystrobin	Heritage	0.1-0.4	Headway	0.05-0.34
boscalid	Emerald	0.09-0.13	Honor	0.06-0.12
chorothalonil	Daconil	0.8-4.1	Concert Instrata Spectro	0.8-4.3 1.0-4.1 2.2-4.1
fludioxonil	Medallion	0.1-0.3	Instrata	0.04-0.17
flutolanil	Prostar	1.1-3.2	Systar	1.0-3.1
iprodione	26GT	0.75-2.0	26/36	0.5-1.9
propiconazole	Banner	0.08-0.65	Headway Concert Instrata	0.08-0.57 0.6-0.3 0.16-0.65
pyraclostrobin	Insignia	0.10-0.18	Honor	0.09-0.18
thiophanate-methyl	3336	1.0-3.0	Spectro Systar 26/36	0.5-1.0 0.6-1.7 0.5-1.9
triadmefon	Bayleton	0.13-1.00	Tartan	0.25-0.50
trifloxystrobin	Compass	0.05-0.13	Tartan	0.05-0.10

Source: Pace Turf, www.paceturf.org.

example, as it has virtually no non-target side effects. It's so specific, though, that it only works against one pathogen."

Mike Powers, superintendent at Edina Country Club in Edina, Minn., says his chemical program is pretty basic. He knows what works based on his 26 years of experience. Powers subscribes to the adage, "If it isn't broke, don't fix it."

That said, he's all about making his crew's job easier. Convenience and cost savings are the two main reasons he now uses a variety of fungicide combination products.

He uses some to save money and others to combat multiple diseases with fewer applications. Powers uses Instrata to specifically target snow mold. Instrata combines three different products that he would normally use to treat this perennial disease into one, substantially lowering his costs and reducing the amount of applications needed from two to one.

"The less you have to spray, the better off you are, whether it's for the environment

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or for the cost of running the equipment,” says Powers.

Hedway is another fungicide combination product Powers uses; it gives him broader control to tackle a variety of diseases and also saves him money. Powers estimates fungicide combination products can save a superintendent \$50 per acre.

“If you are spraying 25 acres of fairways, that’s significant,” he says. “The manufacturers are giving the cost savings to us. It could be a marketing tool, but it works for me. I don’t think they are a gimmick because they are using proven fungicides.”

OVERUSE

With the convenience these combination products offer, critics question whether they encourage overuse. That’s only a concern if the fungicides don’t have the right concentration of ingredients to control your site-specific diseases, says Gelernter.

“If the component fungicides have been packaged in the right concentrations and

Table 2. Commonly available prepackaged fungicide combinations.

Active ingredient 1	ai 2	ai 3	Common brand names
azoxystrobin	propiconazole	-	Headway
chloroneb	thiophanate-methyl	-	Fungicide IX
chlorothalonil	propiconazole	-	Concert
chlorothalonil	propiconazole	fludioxonil	Instrata
chlorothalonil	thiophanate-methyl	-	ConSyst, Peregrine, Spectro
copper hydroxide	mancozeb	-	Junction
fluopicolide	propamocarb	-	Stellar
flutolanil	thiophanate-methyl	-	Systar
iprodione	thiophanate-methyl	-	26/36, Dovetail, Fluid Fungicide, Twosome
pyraclostrobin	boscalid	-	Honor
triadimefon	trifloxystrobin	-	Armada, Tartan

Source: Pace Turf, www.paceturf.org.

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SETTING THE STANDARD

ratios for the pests you want to control, then you are in luck," she explains. "If not, then you run the risk of either poor control – if there isn't enough of one or more fungicides – or of overuse and unnecessary expense – if one or more of the fungicides is at a higher concentration than you need."

For fungicides such as chlorothalonil, which have restrictions on the annual amount that can be used, it's even more important to carefully calculate how much to apply in each application. See the sidebar for a reference chart PACE Turf developed on how to calculate application amounts.

A SOLUTION FOR RESISTANCE?

Manufacturers often claim fungicide combination products solve resistance. Wong says this is not always the case and there is no concrete evidence to support these claims. A combination product only reduces the probability of resistance occurring.

"There is a good chance that if you are making an application and you have two different

classes of fungicides in that combination product, you may have resistance to one, but it's less likely you will have resistance to both," he says. "To illustrate, if there is a 1 percent chance of having resistance for product A and a 1 percent chance for product B, if you spray them out individually you have 1/100th chance you will have resistance to product A or product B. If you add both products together, the chances that you will have a complete failure are 1 percent of 1 percent, so the probability is much lower than if you use a single fungicide product."

While many of the fungicide tests in plant and disease management reports indicate combination products provide more control, Wong says it's still tricky to evaluate because if you're spraying on a site with a combination product, only one of the active ingredients may be doing the work for you.

"The presence of two active ingredients hides the fact that you have a resistance issue with one of the active ingredients," he says. "That's not a bad thing since a combination

product often saves you from having a complete and total resistance failure."

Whether a superintendent chooses to use a fungicide combination product comes down to the turf manager's experience and judgment to select the most effective, most environmentally compatible and most economical measures for their site-specific diseases. **GCI**

David McPherson is a freelance writer based in Toronto.

Rx PATIENT NAME: ADDRESS:

CALCULATING AIs

To calculate how much of each active ingredient is being delivered in a combination product, PACE Turf offers a calculation spreadsheet, downloadable at http://www.paceturf.org/index.php/public/fungicide_combination_products/

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A survey form is visible in the background, featuring a grid of checkboxes. The words "satisfaction" and "good" are partially visible. A red pencil is positioned diagonally across the right side of the page, pointing towards the bottom right corner.

MEETING THEIR NEEDS

Golfer surveys reveal opportunities for better communications, long-range goals and easy-to-implement improvements.

By Marisa Palmieri

Across the country as superintendents head into spring, many of the programs they're implementing are based on the results of golfer surveys they conducted over the winter.

Referencing an off-season member survey, Jason Busch will be working with golfers to develop a formal golf course standards handbook this year. Busch is the superintendent at The Powder Horn, a 27-hole semiprivate golf course community in Sheridan, Wyo.

The goal of creating the document is to outline the standards the players expect within the budgetary and environmental/weather constraints under which he operates. It will include target green speeds, mowing heights and frequencies for various areas of the golf course – and anything else the membership would like to see included. His goal is to get as many members as possible involved in creating the document and reach a final consensus.