

WINTER PREP

Superintendents can beat annual snow mold nemesis, but not easily

By PETER BLAIS

Superintendents generally agree that snow mold is the major disease Northern courses have to worry about as they prepare for winter.

"We see it on our greens, tees and fairways," said Kevin Ross, head superintendent at Falmouth (Maine) Country Club. "It's a problem every year."

Added Jim Latham, director of the U.S. Golf Association Green Section's Great Lakes Region: "It's a major problem throughout the northern tier of states. We had more gray snow mold problems than usual this past winter because of the heavier-than-normal snow cover."

Host grasses include many varieties of bentgrass, bluegrass, ryegrass and fescues.

The two main snow molds are gray (typhula blight) and pink (Microdochium patch).

Gray snow mold is prevalent on snow-belt Northern courses where snow stays on the ground for three months or more without a thaw, Michigan State University Professor J.M. Vargas wrote in the second edition of *Management of Turfgrass Diseases*. It can be found in combination with pink snow mold, but its range generally doesn't extend as far south.

Gray snow mold grows and infects at temperatures between 30 and 55 degrees Fahrenheit. On infected turf, circular gray patches ranging from 3 to 12 inches in diameter begin appearing when the snow melts.

Pink snow mold, generally, is more prevalent in areas like the Pacific Northwest with extended periods of cool, wet weather but little snow cover. It is also a problem, Vargas wrote, in any area with a cool, wet spring or fall with some winter snow cover.

Pink snow mold infection occurs below 60 degrees. Without snow cover, the symptoms are circular, reddish-brown spots from 1 to 8 inches in diameter. With snow cover, spots range from tan to whitish-gray to reddish-brown and from 2 inches to 2 feet in size.

Proper cultural practices can help curb snow mold. Grass should not be lush heading into winter, Vargas wrote. The last nitrogen application should occur between mid-August and mid-September



Gray snow mold can be devastating to a golf course, as in this case.

Following is a list of pink and gray snow mold symptoms.

Pink Snow Mold

- Light-gray area appearing bleached, leaves slimy when wet.
- Patches ringed by whitish-pink mycelial growth.
- Patches may be tan, reddish brown and blackish brown.
- Visible mycelia disappears as grass dries.

Gray Snow Mold

- Irregular bleached areas at first spring thaw.
- Leaves matted together.
- Areas covered or outlined by dirty gray mold.
- Sclerotia embedded in tissue.

if gray snow mold is the major problem.

Specific dates for final fertilizer treatments on pink snow mold are more difficult to determine because temperatures and seasons tend to vary more where pink snow mold is prevalent.

Dormant fertilizer feedings are still possible, but should be done in conjunction with effective fungicide applications.

Chemical management is often necessary to combat snow mold fungi, especially on putting greens. However, if left untreated, bentgrass fairways can also fall prey to gray snow mold. Snow mold can kill sections of bentgrass fairways and annual bluegrass will often fill in.

"I am not opposed to annual bluegrass fairways," Vargas wrote, "but those who are should realize that a good preventive fungicide program for snow mold management is necessary to prevent creeping bentgrass fairways from turning

into annual bluegrass fairways."

Mercury fungicides were the standard treatment method for many years. But the Environmental Protection Agency in late June canceled the registration of the last of the mercury-based pesticides, Calo-Clor and Calo-Gran, as voluntarily requested by Grace-Sierra Crop Protection Co. (now owned by O.M. Scott Co.).

Seeing the writing on the wall, chemical companies have shed their mercury-based products. Cleary Chemical Corp., for example, dropped its mercury-containing PMAS line several years ago, according to Technical/Regulatory Manager Rick Fletcher.

Fungicides containing PCNB, chloroneb, fenarimol, triadimefon, propiconazole, iprodione and chlorothalonil are used now. But superintendents must be careful since some fungicides are toxic to certain turf types.

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— Dr. J.M. Vargas

And while one chemical may be effective in treating gray snow mold, it may be useless against pink.

Therefore, superintendents frequently combine two or more fungicides, depending on the types of snow mold they encounter and the grass types on their courses.

Most chemical companies have fungicides and/or fungicide-containing fertilizers that are laid down in the fall and perhaps again during a January or February thaw. Among the various companies are:

• **Cleary Chemical Corp.** has several PCNB fungicides available in wettable, flowable and granular applications; thiophanate-methyl-based 3336 products; and Spotreat. Cleary also markets Greenzit, which is used in combination with other products and at varying rates, depending on the extent of gray or pink snow mold infestation.

• **O.M. Scott Co.'s** FFII fertilizer contains PCNB. It helps control snow mold when applied at double rates under winter-long snow cover or normal rates under intermittent cover. Fungicide IX and ProTurf Fungicide V with chloroneb are also available. Grace-Sierra (which Scott owns) offers PenStar 10-G and PenStar 75 WP, both with PCNB.

• **ISK Biotech Corp. and Rhone-Poulenc Ag Co.** recommend a tank mixture of their two products, according to ISK Turf & Specialty Products Manager Jerry Pauley. ISK's Daconil 2787 is especially effective against gray snow mold and Rhone-Poulenc's Chipco 26019 against pink snow mold.

Continued on page 24

No straw, no hassle in new technique using Microfoam, polyethylene and Velcro

By MARK LESLIE

KESWICK, New Brunswick, Canada — Unnatural measures for unnatural situations. That's the equation for success for Kenny Crayton, superintendent at Mactaquac Provincial Park Golf Course here.

Embattled with the harsh winters of Canada and tired of struggling with straw in covering his greens, Crayton has taken innovative steps to beat the beast. He has devised his own cover, with the help only of a commercial stitcher, and it appears to be the equal of straw in protecting greens from winter kill.

"This hasn't really been tested enough," he said. "I need a winter where there will be four to six inches of ice cover. We get big

rains in January and we get ice buildup and winter kill that destroys the whole green. When that happens, you have to reseed, the green's out of play for a month or two, and you can lose a lot of money."

The Crayton solution? Last winter, instead of covering his greens with a foot of straw beneath a tarpaulin, he covered five using quarter-inch-thick Microfoam and breathable polyethylene mesh which is UV-treated on the bottom.

Using 72- by 90-inch sheets of each, he sandwiched the Microfoam between the polyethylene. The top polyethylene sheet was coated with water-proof spray. He had a commercial stitcher double-stitch the three-piece cover around the edges and add reinforced eyelets 18 inches apart, so

that it could be held down with tent pegs.

"It breathes and can be rolled," Crayton said. "The water-proofing makes the water run off. The insulated foam is going to keep the frost out. And in snow, it acts as a good insulator."

This year he has modified these covers. He has reduced the size to 24- by 30-inches, making them much easier to move around. And Velcro has been sewn around the edges so the pieces can be Velcro-locked together.

The larger pieces, he said, became so heavy that he needed to haul them off the greens with a tractor wench. With the smaller ones, "I still have eyelets on the outside and I can easily add on if I have a bigger green... There will be a couple of

tent pegs along the inside with the Velcro, but not many."

Crayton said the quarter-inch Microfoam has about the same R value, 4, as a foot of straw, and it eliminates the labor involved with straw.

He said straw is cheaper over the short term but more expensive long-term. Straw costs about \$3 a bale and it takes 100 bales to do one of his 8,000-square-foot greens, he said. Estimates for smaller greens run 30 to 40 bales.

The Microfoam-and-polyethylene covers cost about \$700 per green. Yet, the covers last five years or so before UV rays start to deteriorate them.

After two winters, the Crayton-style cov-

Continued on page 24

USGA continues research

Continued from page 1

will minimize the impact of a pesticide? "To an uninformed person, the use of some products is like putting a gun in their hands. For 99 percent of products we have found no negative effects and this would be a waste of research effort. But for a few, you can run into situations that can cause a problem if you don't proceed correctly. We want to focus in on that 1 percent where there may be a problem."

The Green Section and university researchers will "take some basic studies and put the information into more real-world situations and have a positive story to tell on how to use a product and not have any environmental impact," Kenna said. "This is stuff not for scientific journals but for superintendents."

While the new funding will include two or three projects dealing with Best Management Practices, the remainder will support further investigation of pesticide-nutrient fate and attempts to improve models to determine pesticide fate, Kenna said.

"The American public is totally ignorant about pesticides," he said. "They do not understand the concept of quantification of risk."

To most people, the mention of any trace of a pesticide being discovered means danger even though pesticides are found naturally, he said, adding people do not know:

- The mere presence of a pesticide does not mean ill effects.

- The dose makes the poison.
- Chemicals behave in a consistent and predictable way.

Kenna paraphrased University of Florida toxicologist Chris Borgert, who said if chemicals didn't behave that way you could eliminate the Food and Drug Administration because there wouldn't be any drugs.

"People wouldn't be receiving antibiotics and chemotherapy, for instance," Kenna said, "because you could not predict what was going to happen. And even though you could administer a dose, the results would be so inconsistent, you'd never know whether to give it to a person."

"So, it's this failure that we're coming to grips with," he continued. "People have no idea what it means if the USGA releases information that there were 2 parts per billion of a certain pesticide found in leaching fractions from a green. That is the crux of our situation. We have to take it to the next step and start explaining what it means."

Research from the past three years is undergoing peer review and later will be published as a book in 1995. Scientists intend to present the findings at a meeting of the American Society of Agronomy in Seattle the week of Nov. 13.

Among the findings Kenna cited:

- Research has demonstrated that nitrogen leaching is minimal, the turf/soil ecosystem enhances pesticide degradation, and the current agricultural models (particularly Groundwater Loading Effects of Agriculture Management Systems) are inadequate at predicting the fate of pesticides and fertilizers

Projects chosen for future support

Meeting in Houston in August, the Green Section Environmental Research Committee evaluated 35 research proposals and pared them down to eight.

The funded projects include:

- Degradation of Fungicides in Turfgrass Systems, by Dr. Ron Turco of Purdue University.
- Evaluation of Best Management Practices To Protect Surface Water Quality from Pesticides and Nitrogen Applied to Bermudagrass Fairways, by Dr. Jim Baird of Oklahoma State University.
- Modeling Pesticide Transport in Turfgrass Thatch and Foliage, by Dr. Mark Carroll of the University of Maryland.
- Quantification of the Effect of Turf on Pesticide Fate in Soils, by Dr. Bruce Branham of Michigan State University.
- Evaluation of Management Factors Affecting Volatile Loss and Dislodgeable Foliar Residues, by Dr. Richard Cooper of the University of Massachusetts at Amherst.

- Measurement and Model Prediction of Pesticide Partitioning in Field Scale Turfgrass Plots, by Dr. Marylynn Yates of the University of California-Riverside.

- Mobility and Persistence of Pesticides in a USGA Green, by Dr. George Snyder of the University of Florida.

- Evaluation of the Potential Movement of Pesticides Following Application to Golf Courses, by Dr. Al Smith of the University of Georgia.

The last four are followup studies primarily dealing with runoff, volatilization and dislodgeable residues of pesticides.

Each study will receive around \$45,000 to \$50,000 per year for three years, Kenna said. The remaining \$300,000 of the \$1.5 million total funding is set aside for wildlife research. Ron Dodson of the Audubon Cooperative Sanctuary Program is coordinating a meeting in early November with other wildlife organizations to devise a research funding proposal for issues dealing with wildlife on golf courses.

applied to turfgrass maintained under golf course conditions.

- At Rutgers University, a new nematode was developed and released, holding promise for control of white grubs equal to some insecticides.

- Researchers at the University of Kentucky have documented several beneficial predators of white grubs and cutworms that can help reduce pest egg population.

- Pennsylvania State University runoff

plots irrigated with six inches of water per hour yielded nitrogen and phosphorous amounts less than or equal to that found in the irrigation water itself.

- Dislodgeable pesticide residues were only significant immediately after a pesticide was applied to turf.

- Pesticides break down faster in the turfgrass environment than what is typical when these materials are applied to agricultural crops, according to most preliminary results.

WINTER PREP

Chemical companies attack snow mold

Continued from page 22

- PBI/Gordon Corp.'s flagship product is Teremec SP, which combats gray snow mold, pythium and brown patch, according to Central and Northwest Regional Manager Earl Tracy.

- Since 1987, Banner has been Ciba's main product to combat snow mold, according to Doug Houseworth, manager of technical support in the Turf and Ornamental Department. Banner is very effective against pink snow mold, he said. It works well on *Typhula incarnata*, a gray snow mold found primarily in the

eastern United States and Canada.

But it is less effective in heavier-snow-cover areas such as upper Michigan where the *Typhula ishikariensis* strain of gray snow mold is found, Houseworth added.

- DowElanco has marketed Rubigan AS for about 15 years, according to Mark Urbanowski, communications director for the Turf and Ornamental Division. Rubigan AS is a broad-spectrum, systemic fungicide that is effective against both gray and pink snow mold, Urbanowski added.

Microfoam and Velcro key to experiment

Continued from page 22

ers start paying for themselves compared to straw. Plus, he said, "you have far less labor putting the covers on and off."

Last winter, Crayton said, his greens "wintered better than they have in the last few years. I'm optimistic. If I get a lot of ice, I'm not going to get complete kill. Some of the crowns will still be there and the greens will green up come spring."

Crayton is rebuilding the greens on his 18-hole facility and plans to add one per year of his self-made covers to protect the old greens until they get rebuilt. "We're rebuilding two greens a year. Hopefully, when I get the new greens built to USGA (U.S. Golf Association) specs, they will have good drainage and won't puddle, so I'll have less need for the covers," he said. He suggested that superintendents in-

terested in his method experiment by making a small Crayton cover and trying it on a problem green or tee.

He also stressed that covers should be kept out of the sunlight while in storage.

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When the greens come out of the winter and the covers are removed, Crayton recommended using breathable covers on them.

"Once spring comes, the greens have to be able to breathe more than when they're in a dormant state," he said. "Breathable covers protect them from the cold nights and allow them to warm up quicker, increasing the temperatures and acting almost like a greenhouse so the grass germinates quicker. I've seen greens germinate two weeks faster with a greens cover than without."



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