Typhoola is Uncoola in the Snow Mold Belt!

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Typhoola is uncoola because it is the hidden disease — the turf disease you can't see until after it has already done its thing. It eats your grass under a white blanket of snow when there is not much going on in the botanical world except dormancy. Typhula snow mold is uncoola because it raises its ugly head every winter.

Current snow mold management measures rely heavily on fungicide applications (see "Soylent Green", The Grass Roots, Nov./Dec. 1995) and these applications are probably the most expensive of the year. Those of you who got caught with your plants down last fall and didn't get a fungicide applied know the wrath of Typhula snow mold. Last year some locations in Wisconsin had fungicide efficacy breakthrough with the extended snow cover. Advances in turfgrass pathology over the decades have provided turfgrass managers with a wide and efficacious arsenal against the Typhula snow molds. However, these evil Typhula snow molds still worry superintendents.

Superintendents in Wisconsin are very familiar with these turfgrass villains and can easily recognize the symptoms which first appear at snow melt as straw colored circular patches. Sprigs within the patch are matted and sometimes slimy with mycelium and sclerotia. As the patch dries, a thin crust of mycelium can develop over the affected area giving it a bleached appearance. Usually, only the leaves are killed and the crown survives to produce new leaves in the spring. However, the disease can become quite severe as the pathogen invades the crown tissue and then reestablishment may be needed.

The **psychrophilic** (cold lovers) fungal pathogens that cause Typhula snow molds in Wisconsin include *Typhula incarnata* and *T. ishikariensis*. Both are called **facultative parasites** which means that they "can be parasites" but usually live as decomposers. In other words, these fungi spend most of their life as decomposers, but can and will attack stressed turfgrass under deep and prolonged snow cover.

There are two different Typhula pathogens. *Typhula incarnata* is the causal agent of gray snow mold and *T. ishikariensis* is the causal agent of speckled snow mold. *T. ishikariensis* is supposedly the most difficult to control. The incidence and dominance of these two diseases throughout the state of Wisconsin is intimately related to the microclimate of the particular area. However, gray snow mold is generally more common in the southern areas, whereas speckled snow mold is more common in northern regions of Wisconsin. Although these pathogens cause similar symptoms there are some distinct differences between them that aid in proper diagnosis (Table 1).

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Table 1. Characteristics of Typhula species pathogenic to turfgrasses.

	T. incarnata	*T. ishikariensis*
Primary inoculum	sclerotia	sclerotia
Sclerotia		
Color	pink,brown, reddish brown, dark brown	never pink or red but dark amber, dark chestnut, dark brown to black
Debris attachment	firmly attached	easily removed
Size	bigger	smaller
Numbers	fewer	many
Mobility	less mobile	winged sclerotia (flight capable)
Texture	resilient and gelatinous	not gelatinous
Pathogenic activity		
Winter temperatures	warmer	colder
Winter duration	shorter	longer
Snow cover	shorter periods	longer periods
Pathogenicity	less aggressive	more aggressive

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Both pathogens over-summer as sclerotia, and in late autumn, their sclerotia germinate. Cool wet weather (50 to 65° F) favors sclerotial germination. The sexual state usually isn't observed and the primary inoculum is believed to be the mycelium germinating from the sclerotia. Under snow cover, the mycelium infects the turfgrass leaf blades and causes the distinctive disease symptoms. Sclerotia are produced in and on infected leaf blades or sheaths. Then, as spring debris decomposition and turfgrass recovery occur, the sclerotia fall into the thatch layer.

Our understanding of these diseases has changed over the years and so have the recommended management tactics. In 1932, Monteith and Dahl wrote, "Putting greens in the snowmold belt should be fertilized as little as possible after August. Since there is a decided difference in the susceptibility of grasses to this disease, the ability of a grass to withstand attacks of snowmold should be given consideration." Furthermore, these Badger boys wrote, "It is well to treat the greens with one of the mercury fungicides. The removal of snow, the sweeping off of any debris or any mass of the fungus remaining on the putting greens, and any other treatment tending to hasten the drying of the surface after the spring thaws begin, will in many instances tend to reduce late damage by snow mold."

Figure 1.
My dog Elvis standing on a fungicide equivalent-SR7100! Typhula snowmold has nailed the other bentgrass.

Wernham and Kirby wrote in May 1943, "the placing of snow fences to reduce the amount and duration of snow on the grasses has been shown to be a preventative measure."

In 1951, Howard, Rowell and Keil, in their absolutely fantastic bulletin, wrote, "Control: Collect clippings when mowing diseased areas to remove inoculum (sclerotia) on the leaf tips." Gayle Worf wrote in 1979, "If you have had good success with a treatment schedule or practice in past years stay with that program. Compatible combinations of "effective" fungicides are virtually always more dependable during severe winters than individual fungicides applied alone. Summer fungicide programs are generally helpful in supplementing snow mold fungicide effectiveness. Physical removal of snow after March 1 can be useful, especially if topdressing was applied so that desiccation is less likely to occur."

The following abbreviated comments are given to assist Wisconsin superintendents in protecting their tees and greens.

1. If last year's snow mold program worked, don't change it. If it is not broken, don't fix it.
2. Map out previously damaged areas and overseed with resistant varieties.

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3. Be prepared to battle three fungi: *T. incarnata, T. ishikariensis* (Typhula snow molds) and *Microdochium nivale* (pink snow mold).
4. Apply a combination of effective fungicides (i.e. Chipco/Daconil 4 & 8 oz. or Chipco/Daconil/PCNB at 2 & 4 & 4 oz.).
5. Deploy resistant varieties in problem areas where fungicides won't be used. Do this before September 15 with turfgrasses such as velvet bentgrass or SR7100-Colonial bentgrass (Figure 1).
6. Apply 1/2# to 1# dormant slow release organic N. However, don't fertilize in the fall with a quick release N so you have lush green grass going into winter.
7. Snow fences can be placed so the duration and depth of snow is limited.
8. Spring raking or brushing of diseased areas will increase drying and hasten recovery.
9. Crisscross your fertilizer and fungicide applications to increase uniformity.
10. If you use a topdressing put it down after you have applied fungicide.
11. Collect the season's first clippings to reduce inoculum spread.
12. Greenscovers will aid in spring green up (~3 weeks) but they should only be used when a fungicide combo has been applied.

Our snow mold research at the O.J. Noer Facility endeavors to provide improved consistency, economy, human safety and environmental protection. Your observations, suggestions and concerns on snow mold development in relation to your management strategies is greatly appreciated.

Literature cited

Howard, F.L., Rowell, J.B., and H.L. Keil. 1951. *Fungus Diseases of Turf Grasses.* Agricultural Experiment Station University of Rhode Island - Kingston. Bulletin 308.

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May Meeting — A Soaker

By Andrew Kronwall

The overcast morning of May 20th didn't stop 80 superintendents from making the trip to Zimmermann's Kettle Hills Golf Course in Richfield, Wisconsin. Now hungry for that first outing of the year, superintendents and sales reps from around the state converged on golf course superintendent Bob Belfield. The pressure was on, but Bob and the staff of Kettle Hills were ready and able to accommodate those brave enough to venture out into the drizzle for a friendly round of golf. Although only a few finished, we were able to see the wonderful condition Bob has his golf course in, despite the weather.

We played a Modified Peoria format between the downpours. The die-hard finishers were:

FIRST PLACE	
Brian Schmidt	70
Rod Johnson	68
Steve Schmidt	65
Mike Burwick	65
TOTAL	268
SECOND PLACE	
Carl Braem	64
Roy Zehren	70
Richard Chapman	71
Paul Feldhake	66
TOTAL	271

After golf we met for our educational session with Mr. Phil Pellitteri, UW-Madison Department of Entomology, discussing the invasion of Japanese beetles into our state. Along with numerous slides, a display case of specimens and a mountain of information, Mr. Pellitteri had the sales reps smiling and the superintendents reviewing their pesticide budgets.

Dr. Doug Maxwell, UW-Madison Department of Plant Pathology, (first time golfer extraordinaire) presented a brief report on the Turfgrass Disease Diagnostic Lab (TDDL). The TDDL will be a great resource for superintendents throughout our state. The TDDL is now based in the O.J. Noer Turfgrass Research & Education Facility. Experts in plant pathology are available to assist turfgrass managers for immediate consultation. For a complete overview of the TDDL pull out your March/April edition of *THE GRASS ROOTS*. The article titled *Wisconsin TDDL Takes Big Step Forward* written by Bob Erdahl will explain all the great things happening at the TDDL. If you haven't read this article yet, do yourself a favor and read it start to finish ASAP.